

FLIGHT

&
The AIRCRAFT
ENGINEER.

First Aero Weekly in the World.

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EDITORIAL COMMENT.

THE announcement of the changes to take effect in the higher ranks of the R.F.C., which was made last Saturday by the Secretary of State for War, will scarcely have taken by surprise any who have followed with close attention the trend of events in the flying services. The effect of the announcement is that General Henderson vacates the post of Director-General of Military Aeronautics and is succeeded by Major-General J. M. Salmond, while Major-General Brancker, hitherto Deputy-Director of Military Aeronautics, has been "appointed to a command abroad," his present post being in the meantime left unfilled.

The Changes in the R.F.C.

There need not be any misunderstanding as to the meaning of the changes, which are simply a part of the scheme of reorganisation of the whole of our aerial services which has been impending for some time past. General Henderson goes to undertake special work, the carrying out of which will occupy his whole attention, and which has thus made it essential that another chief of the Military Wing should be appointed. What that special work is cannot, for very obvious reasons, be discussed here and

now, though it is perhaps permissible to say that his exceedingly valuable experience will not be lost to military aviation. The R.F.C. has lost an able and devoted chief, but it can lay this consolation to its soul corporate that he will quite possibly be able in his "special work" to labour as devotedly for military aviation in the future as he unquestionably has in the past.

It was seven years ago, when he was 48 years of age, and on sick leave, that General Henderson first identified himself actively with flying. At his own expense he took a course of training in flying at one of the private schools on Salisbury Plain and rapidly qualified as a pilot, his R.Ae.C. certificate being numbered 118. That was in the days when the War Office looked askance at the new thing and would have none of it, except so much as was absolutely forced upon it, and it was a great deal to the good at that time that an officer with so distinguished a record as he already held should have associated himself prominently with the new science. Two years later, in 1912, he went to the War Office as Director of Military Training, and was very closely identified with the Military Aeroplane Trials on Salisbury Plain. In 1913 he was appointed to the post he has just vacated, and it was due almost entirely to his energy and foresight that, when the present war broke out, the all too few squadrons of the R.F.C. were in the highest possible state of readiness for war. But the work he was able to achieve for the Air Service before the war, valuable indeed as it was, has been dwarfed into insignificance by what has been accomplished under his direction in the three years of actual hostilities. From the three or four squadrons which were all we had to accompany the first Expeditionary Force of glorious memory, the R.F.C. has expanded to a size which, although we cannot give definite figures, is quite comparable to the growth of every other arm of the service. As a matter of fact, it will probably be found when at last figures can be quoted that the growth of the Flying Service has been even greater than that of the other arms. Thus from a mere nucleus, hopelessly inferior in all but the gallantry and skill of its personnel to the aerial forces at the disposal of the enemy, General Henderson has evolved a great and glorious Service which is at last decisively superior to that of the Germans, not only in the quality of its personnel, but in the numbers and types of the machines which form its squadrons. Whatever good work and achievement may lie before Sir David Henderson in the future, it will remain for history to record that it was he who really created

the Royal Flying Corps as we knew it during the Great War, and it will be by that he will be chiefly remembered.

His successor, General Salmond, brings to his new task boundless energy and the reputation of being a great organiser. Moreover, the whole of his service in the present war has been with the R.F.C., of which he has been an officer since 1912. He will have the advantage of finding all the creative work already done by his predecessor, and will thus be at liberty to devote himself entirely to the task of organising for victory all the resources he will find ready to his hand. Until now he has been responsible for the training of pilots of the R.F.C., and during the year he held the post of Director of Training he multiplied the monthly output of pilots by ten, at the same time greatly increasing their efficiency. That by itself is sufficient to stamp General Salmond — the youngest Major-General in the Army, by the way — as the right man to succeed so able a chief as Sir David Henderson.

Before the present war broke out General Salmond had already a fine record of service behind him. He served during the South African War with the King's Own Royal Lancaster Regiment, and gained the Queen's medal, with three clasps. He afterwards went to the West Coast of Africa, where he served for three years with the West African Frontier Force, and returned to England in 1906, being promoted captain in 1910. Two years later he took up flying, and qualified for his brevet at the Grahame-White School at Hendon, and was shortly after appointed an instructor at the Central Flying School at Upavon. In the following year he became a squadron commander, and in 1914 was given a brevet majority. When the war broke out he went to France in command of a squadron, being mentioned in Sir John French's despatch of October, 1914, and in recognition of his consistently brilliant work at the front, he was promoted temporary lieutenant-colonel and made wing commander early in 1915, and later in the year received a brevet of lieutenant-colonel. Promotion again

came his way last year, when he became brigadier-general, and, as has already been stated, was made responsible for the whole of the flying training of the R.F.C. Now, at the early age of 36 he is a Major-General and head of the R.F.C., a position to which he has won by sheer hard work and outstanding merit.

“All Hands to Aeroplanes.” Not before the time was ripe, a number of our daily contemporaries have called attention to the way in which “luxury

trades” are absorbing a very large amount of labour which ought to be devoted to increasing our output of aircraft. It is surely time for the Government, which has certainly not erred on the weak side when it has been a case of interfering with the liberties and pursuits of the people in other directions, to step in and deal drastically with certain of these trades which are doing nothing towards winning the war but are, on the contrary, postponing the day of victory by the absorption of useful labour.

The *Daily Mail* the other day reproduced a number of advertisements from the columns of a provincial journal offering munition rates of wages and bonus to jewel-case makers, jewellers, joiners and shop-fitters, and silver-

smiths. As the *Mail* remarks in quoting from one of these, “girls who can use the blow-pipe” are wanted for welding and fine metal work on aeroplanes. Cabinet makers are required for propeller work, and woodworkers of all kinds for other constructional work in connection with aircraft production.

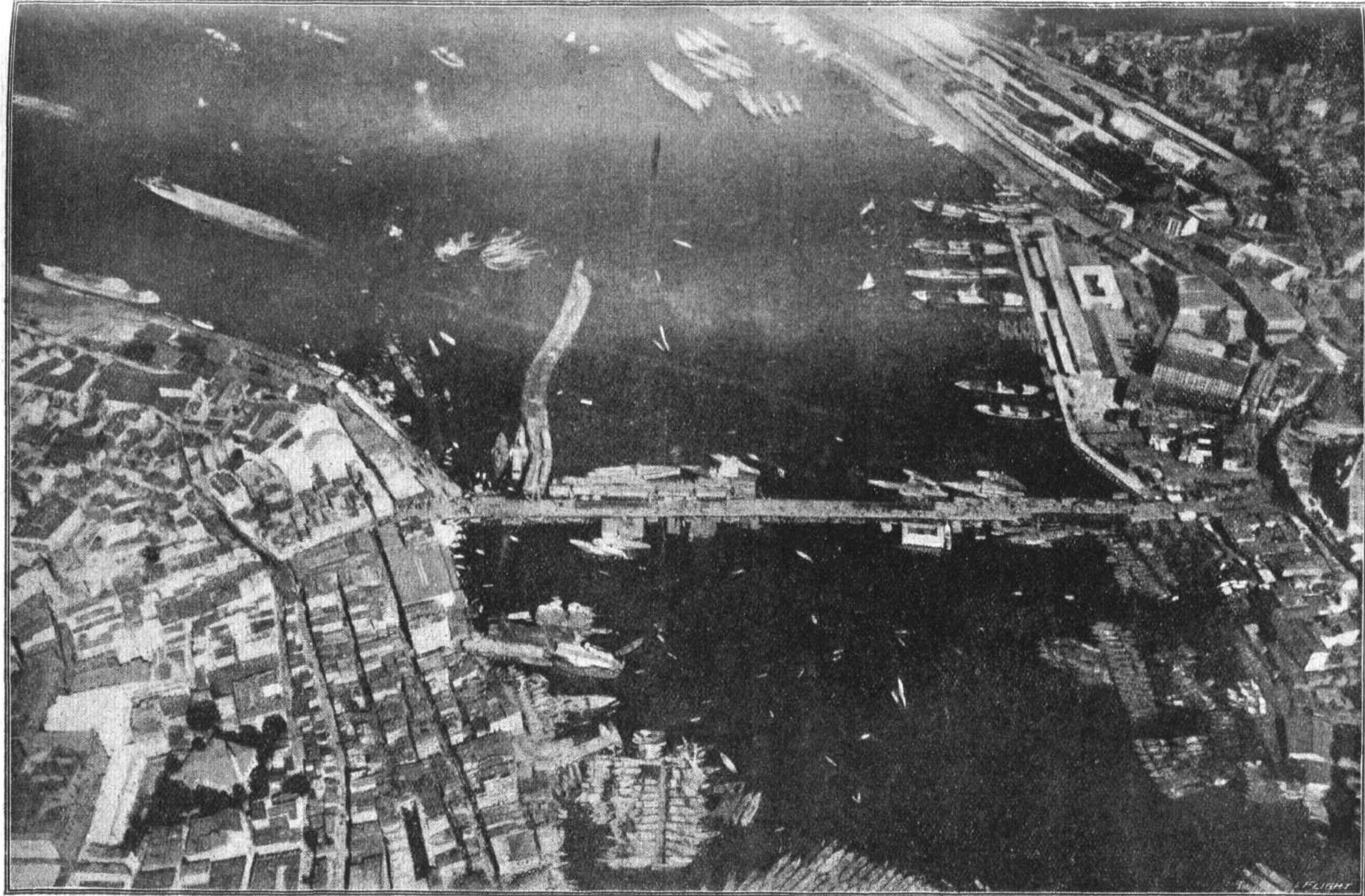
Apparently, the heads of the furniture and wood-working trades fully recognise the need for a transference of labour from private to aeroplane work, and employers and unions have offered to the Government 25 per cent. of the men they now employ. While recognising the patriotic character of the offer, it should be impressed upon employers and unions alike that the supply of skilled labour for aircraft construction is even now inadequate to the demand, while the shortage will become progressively greater as the new programmes of construction in readiness



Photo. by Langfrier, 23A, Old Bond Street.

Major-General John Maitland Salmond, C.M.G., D.S.O., the new Director-General of Military Aeronautics.

OCTOBER 18, 1917.



Bird's-eye view of a portion of Constantinople, photographed from the air.

FLIGHT
SAFETY
AND
RELIABILITY

for next year's campaign in the West are pushed along. It simply amounts to this, that the people who want new furniture will have to wait until we have won the war. Everything of a private nature must be made subsidiary to the great task in which the Empire is engaged, and no needs of the individual must be allowed to hinder its completion by a single instant. It is true that recent Orders restricting the use of certain woods and spirits will automatically reduce the output of "luxury" furniture, and there will thus be released a certain proportion of labour which can then be turned to better account, but the thing goes deeper than that and seems to us to call for the most serious consideration of the Cabinet. It is not only the wood-working trades that are concerned in this "luxury" trading. There are numberless others which are absolutely non-essential and which cater simply for the munition worker and the profiteer with "money to burn." They are doing nothing for the national cause—indeed they are a drag on the wheels of the War Loans—and it seems to us that the time has come when there should be a drastic combing out of all the non-essential industries which absorb useful labour.

♦ ♦ ♦

**Organising
Our
Man-Power.**

It is on the cards that the question of these non-essential trades to which we have referred above will come within the range of the plans of Sir Auckland Geddes, the new Minister of National Service. Speaking at Nottingham recently, he pointed out that there are four great fields of civil national effort which require more men. The first of these is the field of the shipyards; the second that of the production of steel, including the winning of iron ore; the third that of the making of aerodromes; the fourth the production of aircraft and aeroplanes. Sir Auckland went on to say:—

"How are we to obtain men for them? In speaking at Edinburgh the other day I declared that I was convinced that any measure of industrial conscription would fail in its purpose. That declaration I now confirm. But to-day labour is needed where no labour is available. What is to be done? I propose to beg, borrow, or persuade to work with me every scrap of civil organisation now existing, whatever it was designed to do, if by any conceivable chance it can be made to serve the turn. I hope to see the day when every trade will have its committee to which we can turn in our hour of need and say "Help us to find men for this or that aerodrome, or men for that shipyard," or whatever it may be. The system is already at work and is developing. I am not going to issue any general appeal for men. When I want men for a job I propose to say so, and to say what the job is and what the terms are. We shall advertise our needs through the unions of likely trades, through trade committees, and at the Employment Exchanges, and when the need has been met we shall say so."

Certainly, this looks like business, but still we miss from it the essential statement of what the Department intends to do when it knows that the necessary labour is available but fails to come forward. It is unfortunate, but it is nevertheless true, that there is a section, employers as well as employed, which does not put the needs of the nation first, and which thinks more of plans for dodging its obligations, military and civil, than of assisting the common cause. For our own part, we are dead against anything that even

looks like industrial conscription, because we believe that, properly handled and with the necessary weight of public opinion behind it, the voluntary system will do all that is requisite. But if that system is to succeed we cannot live much longer in an atmosphere of pious hope. That it has been which came so near to working our undoing at any time during the first two years of the war, and it is time we had done with hope and got down to serious work. It is the problem of thus getting down to serious work that Sir Auckland Geddes has to solve, and we are bound to say that he is approaching his task with the mien of one who knows what he wants and means to get it. He, like ourselves believes he can get it under a voluntary system, but we take it he has a similarly open mind, and will not hesitate to apply for greater powers than he at present possesses if that system should by any chance fail. The main thing is, that however profoundly devoted we may be to voluntary service and however deeply we may believe in it, we must never lose sight of the fact that all that matters is the early consummation of victory over the enemy. If we find we cannot beat him without making use of a modified system of compulsion, then compulsion it must be. We must be willing to sacrifice all our ideals, if necessary, in pursuit of the one great one of winning the war and winning it early.

♦ ♦ ♦

**Industrial
Unrest
and its
Cure.**

We have more than once in these columns expressed the conviction that the major portion of the undoubted industrial unrest existing at present is the result of an imperfect understanding between labour and the Government departments. The whole question of the allocation of labour to its varied tasks has been dealt with in so piecemeal and fragmentary a fashion and with, in many instances, so conspicuous a want of tact and consideration, that it is little wonder misapprehension has been created and that, instead of pulling with the Government for the common good, labour has become restive and suspicious of the good faith of the departments. It is good, therefore, to know that the Report of the Commission on Industrial Unrest seems to show that the Commissioners have got to the root of the main trouble so far as the causes for possible misunderstanding are concerned. These root causes are now, we are glad to be able to record, apparently in a fair way to removal. But still a great deal remains to be done before we are able to say that all the causes contributing to unrest in the labour world have been finally removed. It would be Utopian to hope for their complete removal—so long as "capital" and "labour" survive there must be constant points of friction existing which will render impossible an era of complete peace and rest—but a lot can be done to mitigate them by the evolution and maintenance of a system which will as far as possible prevent the victimisation of individuals which has been one of the chief complaints of labour during the period since the passing of the Military Service Act. Late as it is in the day, we might usefully take a leaf out of the book of our American Allies, who have initiated a complete census, occupational and educational, of the men of the national army. The object of the United States War Department is to carry the selective service law to its logical conclusion, and to increase the efficiency of the Army, by putting the right men in the right place.

With this in view, a personnel organisation has been established in each of the 16 cantonments. The previous occupation, education, and preference for service of every man are recorded on individual cards, which are then filed and analysed at the divisional personnel office in each cantonment.

In this work the War Department is having the assistance of a body of civilian experts organised under the name "Committee on Classification of Personnel in the Army" and including a number of professional employment managers loaned to the Government by large industrial and business concerns.

The data collected will be used within the divisional organisations to assist division commanders in making the best possible assignment of their men. It will also be of importance in locating men fitted for special branches of the service, such as aviation, the Ordnance Corps, &c., for which it may be necessary to assign men from the cantonments.

It is the only way in which the round peg can be fitted into its proper hole and in which the pitiful spectacle can be avoided of the skilled mechanic spending his time in scrubbing cookhouse floors, or the theatrical manager being told off to superintend the construction of tanks. We had it in our hands to have carried out a similar classification of all men liable to military service under the new Act, but nothing of the sort was done, with the result that men who ought in the interests of the nation to have been left in their occupations have been drafted into the Army, while unskilled workers with a "pull," or whose employers were absolutely compelled to appeal for them because all the good material had been already taken, were left in civil life instead of being taken for what they were, from the national point of view, most fitted for—soldiers. Whether it is too late to rectify this is a matter upon which we do not feel competent to pass definite judgment. We fear it is, and that we are condemned to muddle through the rest of the war with very slight modification of the chaos which a little forethought and foresight might have very largely avoided. Even so, it is not too late to introduce some little system into the selection of the men who are to serve in the army and those who are to be left to work of national importance in civil life. We believe the new Director of National Service, fortified by the findings of the Commission we have referred to, will be able to accomplish at least a little towards increasing the national efficiency and at the same time to allay some of the unrest in industrial circles.

Night Raid Warnings.

The Home Secretary and the Commissioner of Police have decided that, in view of the experience gained during the recent German air raids, the adoption of night signal warnings, similar to those in use by day, is inadvisable. The view of the Home Office and Scotland Yard is that night alarms would bring thousands of people from the comparative safety of their own houses into the streets, and in the rush for outside shelter they would be taking greater risks than if they remained under their own roofs. At the same time,

further methods of warning are being tested, and every suggestion of a practical character is being carefully considered, but the present system of warning has up to the present been found more satisfactory than any other yet devised.

We are in complete agreement with the authorities in this matter of night warnings, as we said when the discussion of to warn or not to warn was running its course in the columns of the sensational Press. We then gave our reasons, which were practically identical with the conclusions now announced by the authorities as having been arrived at through experience in repeated raids.

Industrial Reconstruction.

We welcome wholeheartedly the suggestion for the formation of a Council for the Study of Industrial Reconstruction, which has really gone beyond the suggestion stage and has taken on concrete shape. It has the backing of a large number of leading professional and business men and of a very large section of the trade Press of the country, representing, in the words of the announcement which lies before us, interests as wide apart as confectionery and flying machines.

We are aware that the Government has taken in hand the problems connected with the huge industrial reconstruction which will have to be carried out after the war, but all the official effort in the world will not avail to re-establish our industries and rehabilitate our commerce unless the people most concerned will assist in saving their own souls by a careful examination of the problems which are likely to arise and by formulating methods for dealing with them. It is this that the Council has, primarily, been called into existence to do, and, if it is possible to judge by its constitution and objects, then it should have a very useful sphere of work in which to prosecute its activities. Briefly, the scheme is to provide for representation on the Council of all associations, societies or chambers of commerce or trade and of the trade unions. Every such body would be constituted an electoral college for the purpose of electing Trade Councils in order to carry out the work of reconstruction, with particular reference to such specific problems as securing a greater degree of co-operation between manufacturers; co-operation between labour and capital, and the avoidance of industrial strife; and "output regarded as a duty by both capital and labour." This last we regard as being of the very highest importance, for the necessity of greatly increasing the national output is so imperative that it cannot be left to chance and the responsibility cannot remain with individuals. It thus becomes clear that some national scheme must be adopted which shall secure the objects in view, and if the activities of the new Council were to be confined to this we should still give it our blessing. But its proposed work goes far and away beyond this, and, provided the initial programme is not made so wide as to become controversial, which is always a danger in these matters, we foresee that it may become a considerable power in the land.

New Director-General of Aeronautics.

The Secretary of the War Office made the following announcement on October 12th:—

Lieut.-General Sir David Henderson, K.C.B., D.S.O., having been deputed to undertake special work, has been lent for such services, and has thereby vacated his seat on the Army Council.

The Secretary of State for War has appointed Major-General J. M. Salmond as his successor as Director-General of Military Aeronautics, with a seat on the Army Council.

Major-General Brancker, at present Deputy Director of Military Aeronautics, has been appointed to a command abroad, and for the present his place will not be filled.

TWO STANDARD TRACTOR BIPLANES.

SINCE our description of the Standard H-3 tractor biplane, which appeared in "FLIGHT" for May 24th last, two other models have been turned out by the Standard Aero Corporation of New Jersey, U.S.A., viz., the "J" preliminary training tractor and the J-R reconnaissance type. Both

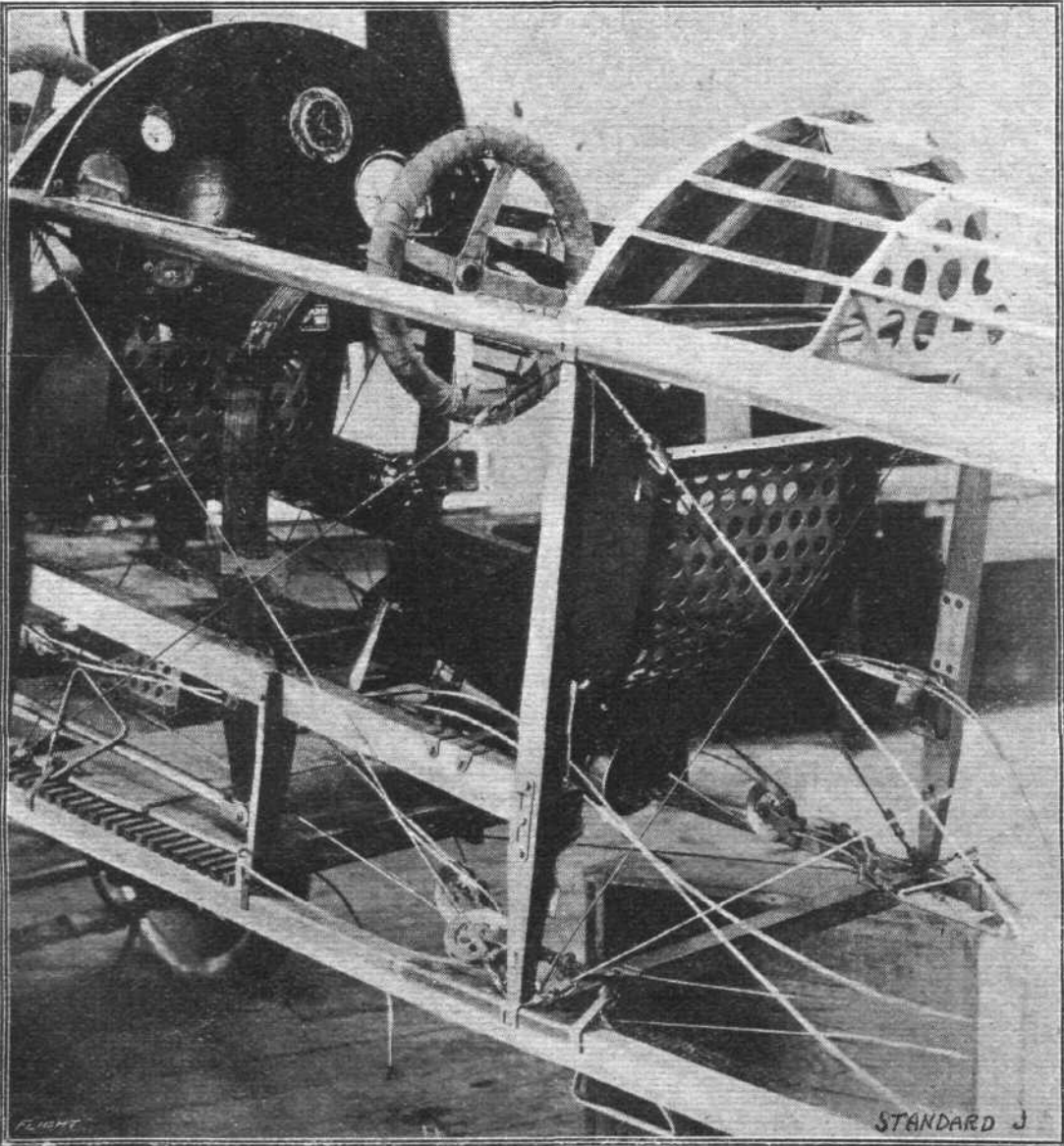
feature of this machine is its low landing speed—37 m.p.h. This, together with the three-wheeled landing chassis, makes it a comparatively safe and easy machine for beginners to practice landings—always the bugbear of the embryo pilot. Strength, another valuable asset in a training



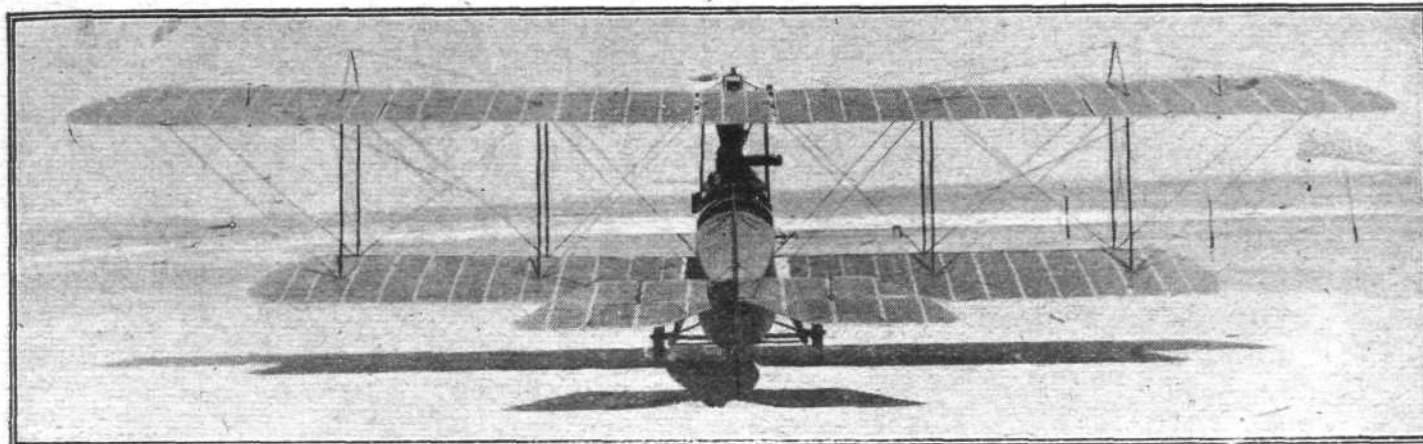
Three-quarter front view of the Standard model J tractor biplane.

are from the designs of Chas. H. Day, and follow more or less closely previous Standard practice. The model J has given very satisfactory results as a training machine, and is now, it is stated, being manufactured in quantity. The special

machine, has also received the attention of the designer, a factor of safety of 7.5 being employed throughout the machine. A certain amount of natural lateral stability is obtained



The rear cockpit of the Standard model J tractor biplane.

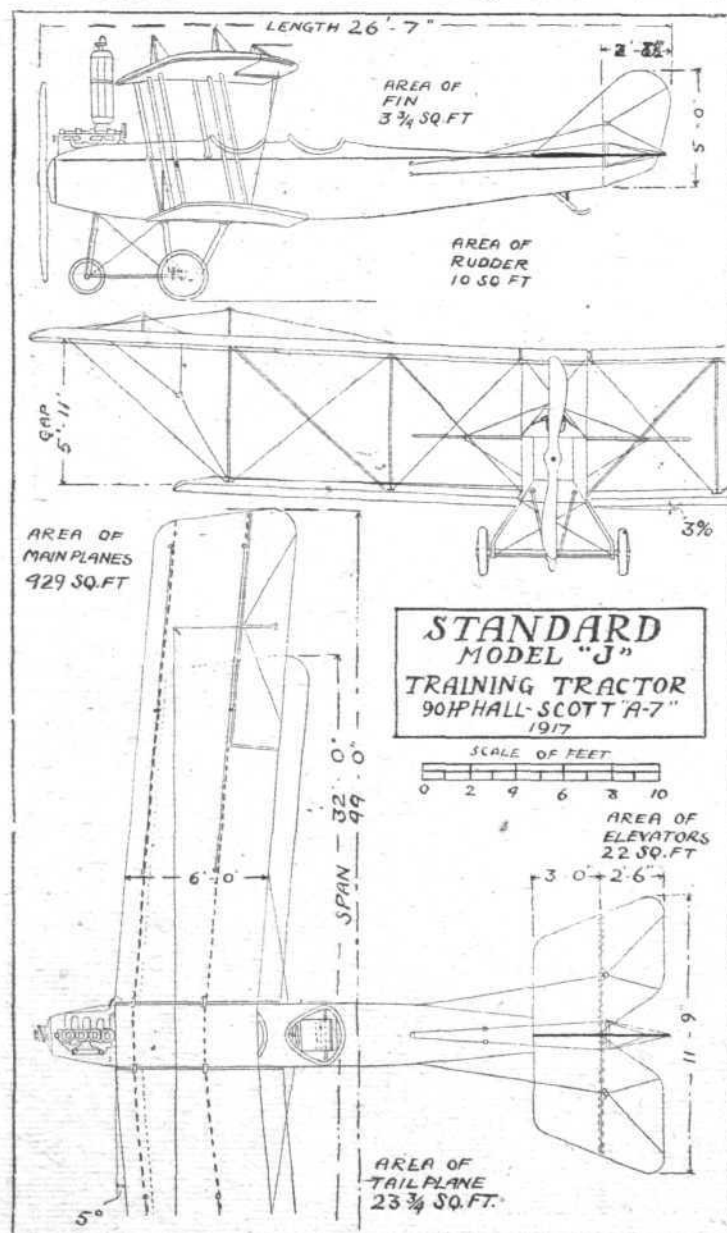


Rear view of the Standard model J tractor biplane.

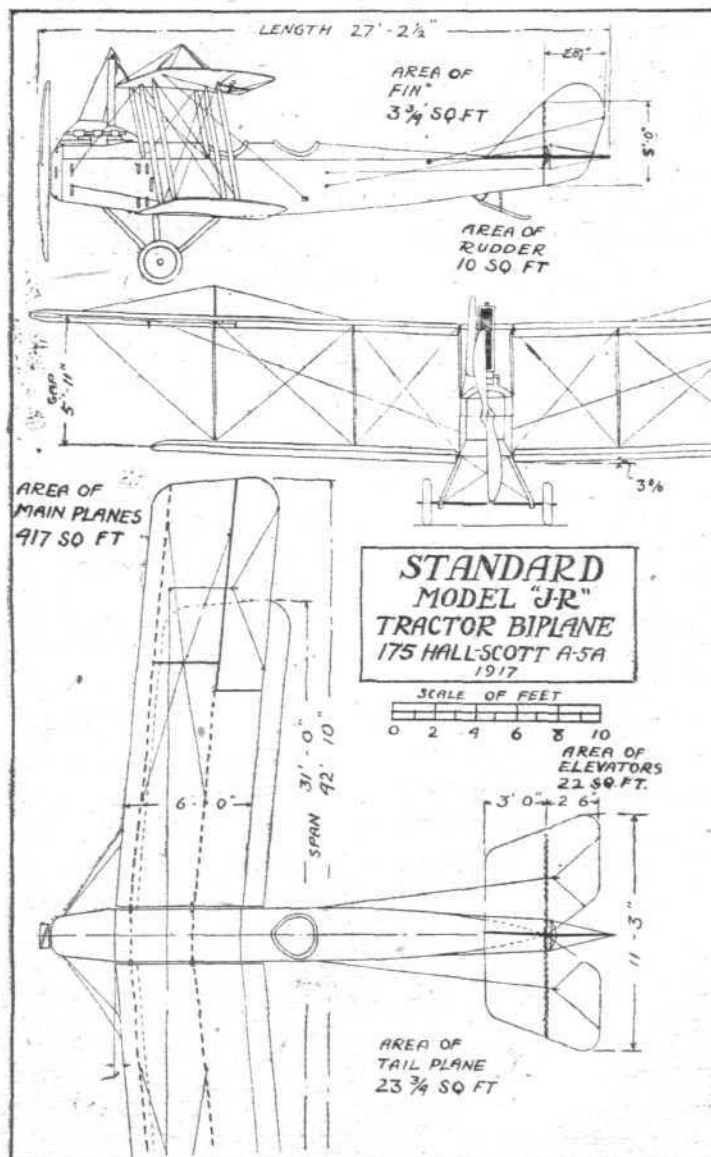
by giving the wings a back-sweep of 5° , whilst the low wing loading of 4.5 lbs. per square foot and the employment of the R.A.F.3 wing section make for good climb and the low speed. Unlike the H-3, the top plane, which alone carries the ailerons, overhangs the lower plane by 6 ft. each side. It is also staggered forward about 1 ft. Attachment of the top plane is made to a small central panel, of the same width as the fuselage, supported above the latter by four struts. The overhung is braced from a cabane mounted above the outer pair of interplane struts. The two sections of the lower plane are attached direct to the fuselage. The wing and other fittings, as on the H-3, are noteworthy for their elaborate character, necessitating intricate brazing.

The pantograph type rubber shock-absorbing device is fitted to the landing gear as before; the main wheels measure 26 ins. by 4 ins., and the front wheel is 20 ins. by 4 ins. The control is of the dual, interchangeable Dep.-Curtiss type. The engine is a 90-100 h.p. four-cylinder vertical Hall-Scott "A-7," coupled direct to a Standard black walnut tractor screw. The radiator, which is long and narrow, is mounted above the engine. Except for detail improvements, the model J is otherwise similar constructionally to the H-3, so the following characteristics, together with the accompanying illustrations and scale drawing, should suffice:—

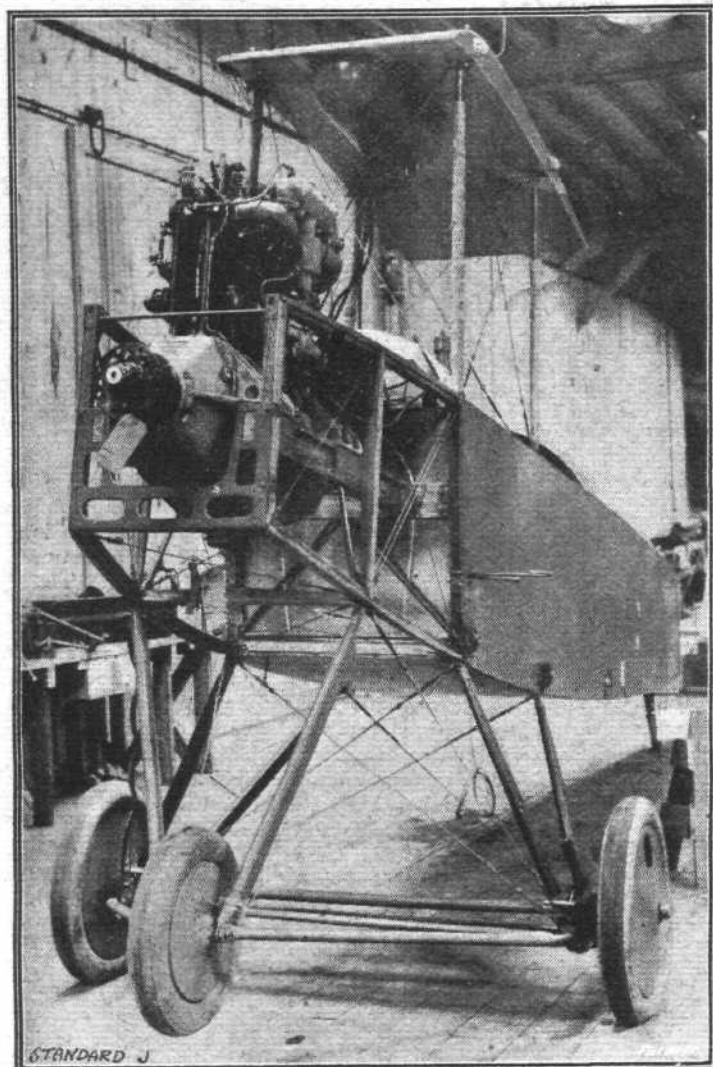
Span, (top) 44 ft., (bottom) 32 ft.; chord, 6 ft.; gap, 5 ft. 11 ins.; sweep-back, 5° ; dihedral angle, 3 per cent.; wing section, R.A.F.3; angle of incidence, $2\frac{1}{2}^{\circ}$; overall length, 26 ft. 7 ins.; area of top plane, 264 sq. ft.; bottom plane, 165 sq. ft.; total supporting surface (including ailerons),



The Standard Model J Training Tractor Biplane.—Plan, side and front elevations to scale.



The Standard Model J-R Tractor Biplane.—Plan, side and front elevations to scale.



View showing the mounting of the 90 h.p. Hall-Scott 4-cyl. vertical engine in the Standard model J tractor biplane. The arrangement of the three-wheeled landing chassis is also clearly shown.

429 sq. ft.; area of ailerons, 42 sq. ft.; loading, 4.5 lbs. per square foot; weight, empty, 1,350 lbs.; useful load, 600 lbs.; speed range, 37-68 m.p.h.; climb, 2,600 ft. in 10 minutes; gliding angle, 1 in 8.

The Standard model J-R is similar in general form to the

model J. It has, in fact, been evolved from experiments made with, and data obtained from, this latter machine. Instead of a 90 h.p. engine, one of 175 h.p.—the 6-cyl. Hall-Scott model A-5A—has been installed, whilst the wing section is the U.S.A.6. These two modifications, together with a reduction in wing area, give a maximum speed of 95 m.p.h. and a climb of 5,000 ft. in 10 minutes. The span of the top and bottom planes is 42 ft. 10 ins. and 31 ft. respectively, the chord, gap, stagger, sweep-back, dihedral and angle of incidence are the same as on the model J. The central panel of the top plane is, as before, the same width as the fuselage, 2 ft. 6 ins. A space of 1½ ins. is left between the panel and the wing sections, as is also between the fuselage and the lower wings. Among the special features of the J-R are the following: In the two-wheeled steel landing gear, which combines lightness with strength and is well streamlined, the axle rises and falls in vertical guides, and when normal rests in U-shaped steel cases stream-lined with aluminium. All the interplane struts are provided with ball and socket fittings, giving an even bearing for any angle of the struts. The engine bed is extremely rigid, being braced by means of steel tube stays connecting the ash bearers to the fuselage longerons. The exhaust is led over the top plane by means of a single complete manifold from the exhaust ports, after the fashion obtaining in the majority of German machines. An auxiliary fan-driven gear pump, projecting out from the fuselage, pumps fuel from the main tank of 51 gallons capacity, to the gravity tank, of 7½ gallons capacity, which is mounted on the underside of the central top plane panel.

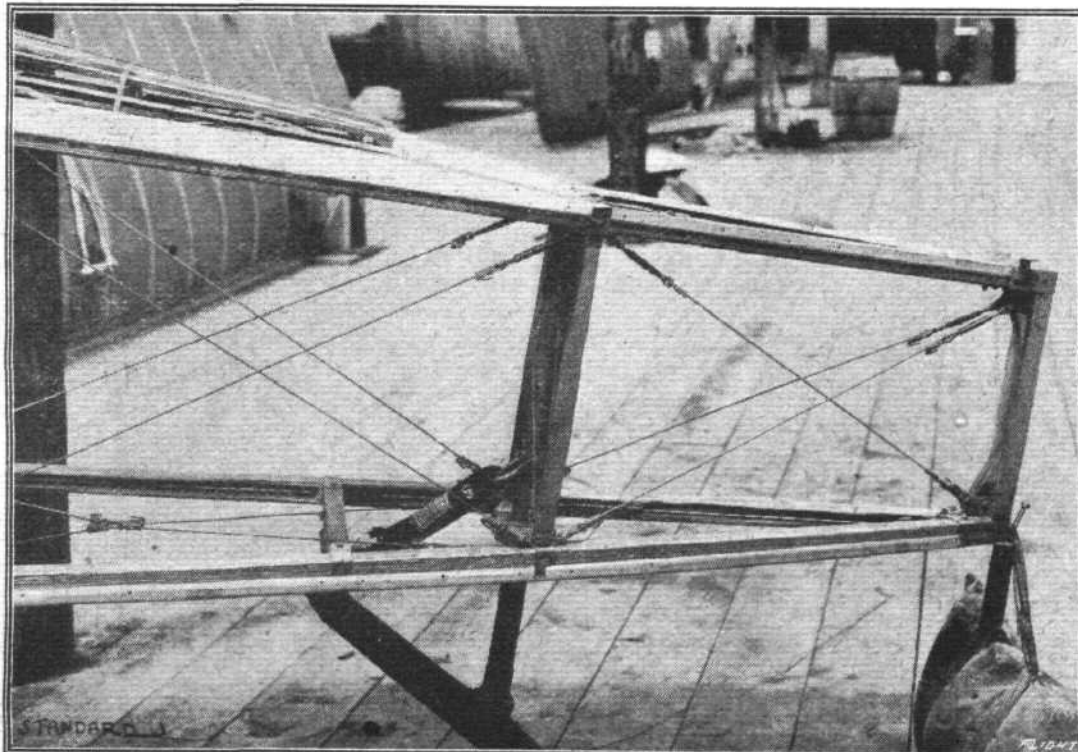
The fuselage is 24 ft. 3 ins. in length, the maximum width is 2 ft. 6 ins., and the maximum depth, at the forward cockpit, is 3 ft. 4 ins. The rounded nose-piece at the forward end of the engine is made detachable. The upper longerons are horizontal to the line of flight, whilst the lower ones follow a continuous curve from nose to tail. Sheet metal is employed for the covering of the engine housing and the top turtle deck as far back as the rear or pilot's cockpit. The remainder of the fuselage is fabric covered. Single Dep. control is installed. The stabilising tail plane is horizontal to the line of flight, and is supported by a pair of bracing wires above and below at each side of the fuselage.

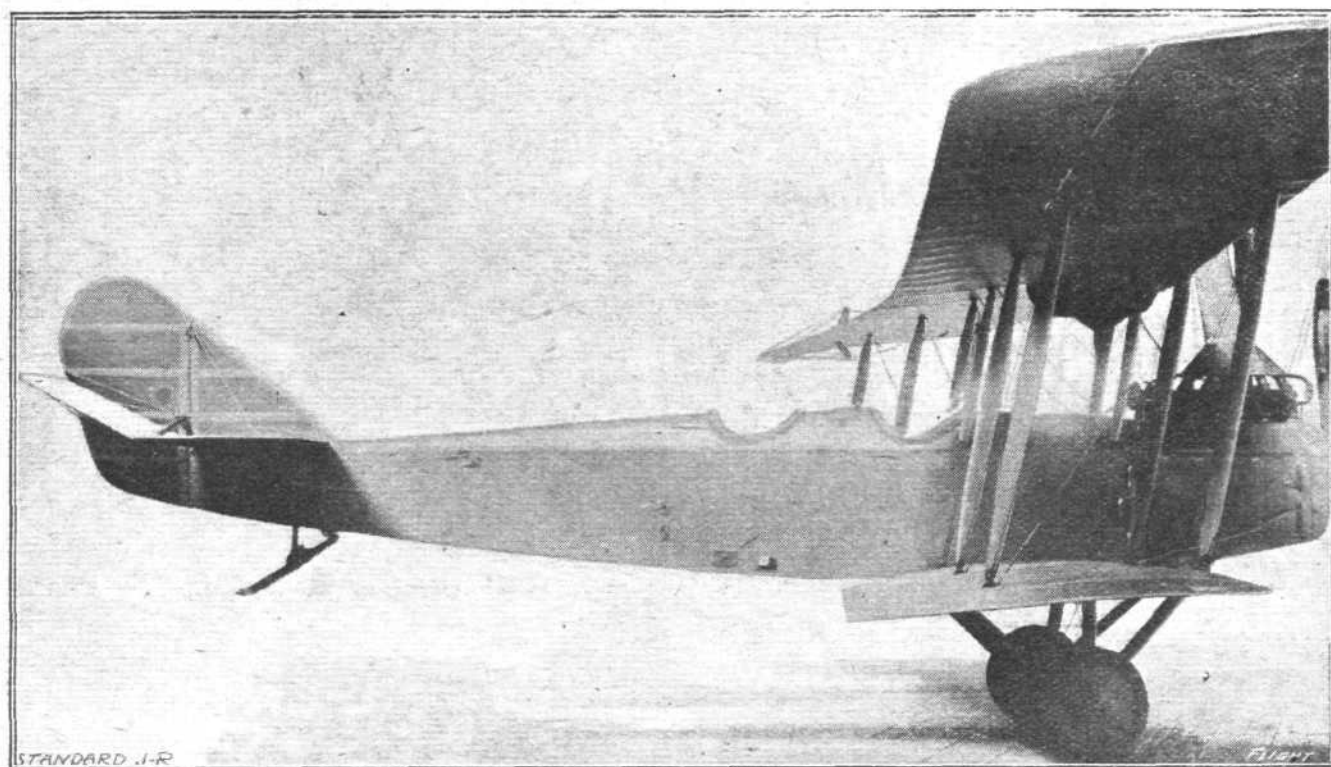
The Hall-Scott A-5A is a six-cylinder vertical water-cooled engine developing 175 h.p. at 1,400 r.p.m. It has a bore and stroke of 5½ ins. and 7 ins. respectively. It weighs 605 lbs., and has a fuel consumption of 14 galls. per hour.

The following are the main characteristics of the J-R: Span, (top) 42 ft. 10 ins., (bottom) 31 ft.; chord, 6 ft.; gap, 5 ft. 11 ins.; stagger, 10°; sweep-back, 5°; dihedral angle 3 per cent.; wing section, U.S.A.6; angle of incidence, 2½°; overall length, 27 ft. 2 ins.; area of top plane, 258 sq. ft.; bottom plane, 159 sq. ft.; total supporting surface (including ailerons), 417 sq. ft.; area of ailerons, 42 sq. ft.; loading, 5.75 lbs. per square foot; weight, empty, 1,764 lbs.; useful load, 636 lbs.; speed range, 48-95 m.p.h.; climb, 5,000 in 10 minutes; gliding angle, 1 in 11.

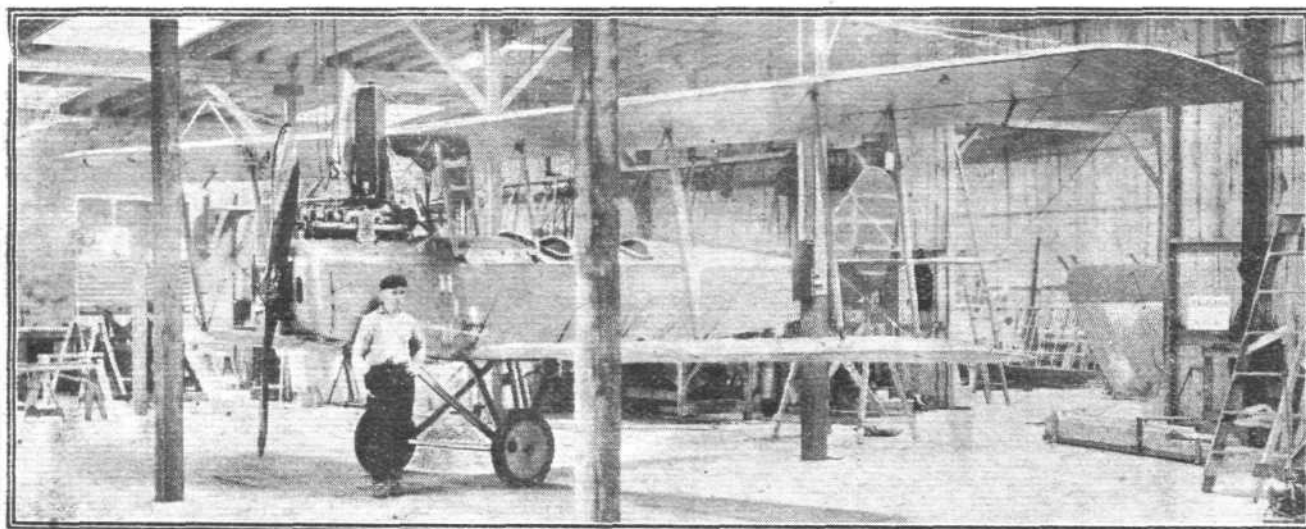
Standard model J

The tail end of the fuselage of the Standard model J tractor biplane.





Side view of the Standard model J-R tractor biplane.



Three-quarter front view of the Standard model J-R tractor biplane.

Lord Derby on Reprisals.

SPEAKING at a complimentary dinner and presentation given at the Exchange Hotel, Liverpool, by the National Union of Dock Labourers and Riverside Workers to one of their members, Private Ratcliffe, of the South Lancashire Regiment, who had won the Victoria Cross at Messines Ridge, Lord Derby, Secretary of State for War, said people at home, had got to show the same enthusiastic spirit, as those at the front, and to keep their nerves calm. This country had, with the aeroplane menace, been brought within the war zone, and they must show the same courage at home as their soldiers did at the front. In London a considerable number of men and women were taking refuge in Tubes on the slightest provocation, but among many of them it was difficult to understand the language they talked. The great bulk of the community was not likely to be rattled by air raids, but he hoped they would never forget them. He recommended that this remembrance should be kept alive, as similar raids were remembered in Venice, by the erection of some memorial stone recording the locality of raids and the murders of women and children killed, with Kipling's words, "Lest we forget." They must distinguish between the types of air raids—those on military objects, such as ours had hitherto been confined to, and those of Germans on undefended towns, involving the

murder of innocent women and children. The former were perfectly legitimate, and no reprisals were asked for, because we had done the same thing ten times, and more effectively than the Germans. But the other kind of bombing, what he would call the political bombing, was designed to demoralise our civilian population, which he did not believe would ever be successful.

But our authorities had now promised reprisals, and all he asked was that the public would now leave the matter in their hands. It would be effectively done, at the right time and in the right way. The only way to stop these raids was to drive the Germans out of Belgium and then to give them something to think of in their own country. Fighting in the air was going to be something to end the war, and nothing in the way of political bombing should be allowed to take the place of the great military air offensive which was to contribute to that object. The Air Board and Ministry of Munitions were fully alive to the fullest necessities of both defence and offence in the matter of aerial activity. All the men and all the machines required would be forthcoming. Great sacrifices had already been made, and, while he fully agreed with reprisals for what had been done in this country, their surest and best remedy was to give Sir Douglas Haig all the help he needed to drive the Germans back to their own country.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Club House.

The following prices have been fixed for the present by the Committee:—

Bedroom (including Bath)	..	5s. each per night.
Breakfast	2s. 6d.
House Luncheon	2s. 6d.
House Dinner	3s. 6d.

Billiard Room.

The Billiard Room is now open for the use of the Members.

THE FLYING SERVICES FUND. administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W. 1.

Subscriptions.

	£	s.	d.
Total subscriptions received to Oct. 9th, 1917..	12,324	6	11
K.P.L.	0	5	0
Staff and Workers of Gwynnes, Ltd. (Forty-eighth contribution)	9	5	8
Sopwith Aviation Co., Ltd., Sports Committee..	125	0	0

Total, October 17th, 1917 12,458 17 7

H. E. PERRIN, Secretary.

3, Clifford Street, New Bond Street, W. 1.

THE ROLL OF HONOUR.

Reported by the Admiralty:—

Previously reported Missing, now presumed Killed.

Flight Sub-Lieut. M. N. Baron, R.N.
Flight Sub-Lieut. G. G. Bowman, R.N.
Flight Sub-Lieut. L. F. W. Smith, D.S.C., R.N.
Flight Sub-Lieut. F. S. Strathy, R.N.

Accidentally Killed.

Flight Sub-Lieut. B. W. Horswell, R.N.
Flight Lieut. M. C. Wood, R.N.

Wounded.

Flight Sub-Lieut. A. F. MacDonald, R.N.
Flight Sub-Lieut. W. H. Sneath, R.N.

Injured.

Flight Lieut. L. L. Edwards, R.N.

Accidentally Injured.

Flight Lieut. C. H. Keith, R.N.
Sub-Lieut. A. C. Snow, R.N.V.R.
Prob. Flight Officer L. E. Swann, R.N.
Flight-Lieut. P. Wood, R.N.

Missing.

Flight Sub-Lieut. N. Black, R.N.
Flight Comdr. A. W. Clemson, D.S.C., R.N.
Flight Sub-Lieut. M. J. Watson, R.N.

Previously Missing, now reported Prisoners.

Obsr. Sub-Lieut. H. Burns, R.N.
Flight Sub-Lieut. E. W. Desbarats, R.N.
Flight Sub-Lieut. W. E. Foster, R.N.
Flight Sub-Lieut. J. R. Wilford, R.N.

Reported by the War Office:—

Killed.

2nd Lieut. E. A. Barnard, R.F.A., attd. R.F.C..
2nd Lieut. H. W. Dawson, R.F.C..
2nd Lieut. J. H. Flynn, R.F.C..
Lieut. J. L. Hughes, Welsh, attd. R.F.C..
Capt. A. P. Loyd, Buffs. (E. Kent) and R.F.C..
2nd Lieut. H. T. Noble, R.F.C..
Lieut. E. H. Pember, R.F.A., attd. R.F.C..
2nd Lieut. C. O. Rayner, R.F.C..
2nd Lieut. H. F. Tomlin, R.F.C..
2nd Lieut. V. J. Woodcock, North'd Fus., attd. R.F.C..
1712 2nd Air-Mech. H. F. Matthews, R.F.C.

Previously Missing, now reported Killed.

Capt. W. T. L. Allcock, R.F.C..
2nd Lieut. R. Applin, R.F.C..
Capt. F. L. Barwell, Lond. R., attd. R.F.C..
2nd Lieut. B. G. Beatty, R.F.C..
2nd Lieut. O. W. Berry, K.O.S.B., attd. R.F.C.

2nd Lieut. P. B. Boyd, Gord. High., attd. R.F.C..
Lieut. J. A. G. Brewis, D.L.I., attd. R.F.C..
2nd Lieut. G. B. Buxton, Norf. R., attd. R.F.C..
2nd Lieut. R. M. Chaworth-Musters, Leic. R., attd. R.F.C..
2nd Lieut. C. C. Cheatle, R.F.C..
2nd Lieut. W. H. Clark, Midd. R., attd. R.F.C..
2nd Lieut. W. J. Clifford, R.F.C..
2nd Lieut. W. B. Cramb, A. and S. Highrs., attd. R.F.C..
Capt. A. T. Cull, Sea. Highrs., attd. R.F.C..
Capt. D. W. Edwards, M.C., A.S.C., attd. R.F.C..
Lieut. G. J. Hatch, Lond. R., attd. R.F.C..
Lieut. T. G. Holmes, R.F.C..
Capt. W. P. Holt, A.S.C., attd. R.F.C..
Capt. L. H. Horncastle, M.C., Wilts. R., attd. R.F.C..
2nd Lieut. R. E. Jeffery, R.F.C..
2nd Lieut. L. G. Lovell, R.F.C..
2nd Lieut. J. A. Marshall, Cyc. Bn., attd. R.F.C..
2nd Lieut. F. A. Matthews, R. Suss. R., attd. R.F.C..
2nd Lieut. K. L. N. McCulloch, Mx. R..
2nd Lieut. L. V. Munn, Leic. R., attd. R.F.C..
2nd Lieut. P. R. Palmer, M.C., Leic. R., attd. R.F.C..
2nd Lieut. E. J. Pascoe, R.F.C..
2nd Lieut. J. L. Peake, Mx. R..
2nd Lieut. R. U. Phalen, R.F.C..
2nd Lieut. P. Sherman, R.F.C..
2nd Lieut. A. V. Shirley, Yeo., attd. R.F.C..
Capt. J. Stuart, R. Innis. Fus., attd. R.F.C..
Lieut. W. G. D. Turner, R.F.C..
Lieut. M. H. Wood, Linc. R., attd. R.F.C.

Accidentally Killed.

65459 2nd Air-Mech. L. G. Mann, R.F.C.

Previously Wounded, now reported Died of Wounds.

78600 1st Air-Mech. G. Brown, R.F.C.

Died of Wounds.

Major C. M. B. Chapman, M.C., Buffs., attd. R.F.C..
2nd Lieut. C. S. Hickie, R.F.C..
8696 2nd Air-Mech. W. Fairclough, R.F.C..
77648 2nd Air-Mech. F. Farmer, R.F.C..
93971 Sergt. F. Potter, R.F.C..
322 Sergt. W. H. Roberts, R.F.C..
42899 2nd Air-Mech. A. E. Wood, R.F.C.

Died.

12360 1st Air-Mech. H. L. Reynolds, R.F.C.

Previously Missing, now reported Died.

Lieut. J. B. Fotheringham, Quebec, attd. R.F.C.

Wounded.

2nd Lieut. C. B. Andrews, North'd Fus., attd. R.F.C..
Capt. T. P. H. Bayetto, R.F.C..
2nd Lieut. C. O. Bean, R.F.C.

2nd Lieut. A. R. Browne, R.F.C.
 Lieut. E. L. Burrell, R.F.C.
 2nd Lieut. B. H. Caswell, R.F.C.
 2nd Lieut. L. H. Clemetson, R.F.C.
 2nd Lieut. J. R. Cudemore, R.F.C.
 2nd Lieut. R. C. Davies, R.F.C.
 Lieut. C. R. Field, A.S.C., attd. R.F.C.
 2nd Lieut. J. P. Flynn, Ches., attd. R.F.C.
 2nd Lieut. G. A. Gillings, R.F.C.
 2nd Lieut. A. W. Harrison, R.F.C.
 2nd Lieut. G. R. Horsfall, Y. and L., attd. R.F.C.
 2nd Lieut. G. C. Leven, R. Suss., attd. R.F.C.
 2nd Lieut. F. A. Martin, R.F.C.
 Capt. G. Merton, R.F.C.
 2nd Lieut. E. D. Neal, R.F.C.
 2nd Lieut. B. Ord, R.F.C.
 2nd Lieut. E. O. Peel, F.R.C.
 2nd Lieut. D. J. Reason, R.F.C.
 2nd Lieut. H. Scandrett, R.F.C.
 Lieut. H. W. Smith, Sher. For., attd. R.F.C.
 2nd Lieut. G. F. Sogno, R.F.C.
 2nd Lieut. R. B. Steele, I.A.R.O., attd. R.F.C.
 2nd Lieut. R. G. R. Townsend, R.F.C.
 Lieut. H. H. Wade, R.F.C.
 Lieut. C. Watson, R.F.C.
 43537 2nd Air-Mech. H. Clarkin, R.F.C.
 10294 1st Air-Mech. C. F. Croome, R.F.C.
 78099 2nd Air-Mech. J. L. Fisher, R.F.C.
 65040 2nd Air-Mech. J. R. G. Goacher, R.F.C.
 49486 L.-Cpl. W. Harrop, R.F.C.
 8574 Flight Sergt. J. P. Juby, R.F.C.
 10566 1st Air-Mech. S. Keyse, R.F.C.
 11862 1st Air-Mech. J. H. Lee, R.F.C.
 23232 Sergt. A. A. L. Moir, R.F.C.
 65062 2nd Air-Mech. H. W. Poole, R.F.C.
 27235 Flight Sergt. E. H. Richmond, R.F.C.
 43662 2nd Air-Mech. W. E. Selway, R.F.C.
 38557 2nd Air-Mech. E. A. Young, R.F.C.
 7492 Sergt. A. Yeomans, R.F.C.

Previously Missing, now reported Wounded and Prisoners in German hands.

Lieut. C. D. Hutchinson, S. Staff. R., attd. R.F.C.
 2nd Lieut. J. B. H. Wyman, R.F.C.

Previously reported Prisoner, now reported Wounded and Prisoner in German hands.

2nd Lieut. G. C. Stead, R.F.C.

Missing.

Lieut. J. W. Bumphrey, Yeo., attd. R.F.C.
 2nd Lieut. W. R. Bishop, R.F.C.
 2nd Lieut. J. F. Bushe, R.F.C.
 Capt. J. S. Campbell, A. and S. Highrs. and R.F.C.
 2nd Lieut. P. J. Casey, R.F.C.
 2nd Lieut. L. A. Colbert, R.F.C.
 2nd Lieut. C. G. Crane, R.F.C.
 2nd Lieut. J. Frost, R.F.C.
 2nd Lieut. E. A. V. Ellerbeck, Yeo., attd. R.F.C.
 2nd Lieut. J. L. Haight, R.F.C.
 2nd Lieut. C. R. B. Halley, R.F.C.
 2nd Lieut. R. P. Hood, R.F.C.
 2nd Lieut. W. L. Inglis, R. Sco. Fus., attd. R.F.C.
 2nd Lieut. C. G. O. MacAndrew, Yeo., attd. R.F.C.
 Lieut. J. M. McKenna, R.F.C.
 2nd Lieut. G. Mathews, R.F.A., attd. R.F.C.
 2nd Lieut. F. M. Nash, R.F.C.
 Lieut. C. D. Scott, Cent. Ont., attd. R.F.C.
 2nd Lieut. L. P. Sidney, K.R.R.C., attd. R.F.C.
 2nd Lieut. R. H. Sloley, R.G.A., attd. R.F.C.
 2nd Lieut. F. L. Smith, R.F.C.
 2nd Lieut. S. Sutcliffe, R. Welsh Fus., attd. R.F.C.
 2nd Lieut. J. G. Warter, Wilts., attd. R.F.C.
 Lieut. G. F. Westcott, R.F.C.
 87650 Sergt. H. S. Foulsham, R.F.C.
 11730 2nd Air-Mech. J. Heedy, R.F.C.
 12187 2nd Air-Mech. J. Jeacock, R.F.C.

Previously Missing, now reported Prisoners in German hands.

2nd Lieut. E. B. Denison, R.F.C.
 2nd Lieut. S. W. Dronsfield, R.F.C.
 2nd Lieut. H. J. Ellam, R.F.C.
 2nd Lieut. C. T. Felton, R.F.C.
 2nd Lieut. H. R. Hart-Davies, R.F.A., attd. R.F.C.
 2nd Lieut. C. G. Mallous, R.F.C.
 Lieut. G. B. McMichael, Hereford, attd. R.F.C.
 2nd Lieut. G. A. Rose, R.F.C.
 Capt. H. M. Rushworth, London R., attd. R.F.C.
 2nd Lieut. E. S. C. Sen, R.F.C.
 2nd Lieut. W. C. Smith, R.F.C.
 2nd Lieut. S. H. Taylor, R.F.C.
 4630 Farr.-Sergt. W. Organ, R.F.C.
 61852 2nd Air-Mech. W. Richman, R.F.C.



"One Service; One Uniform; One Badge."

At the re-opening of the House of Commons on Tuesday, Mr. Kennedy Jones asked the Prime Minister whether having regard to the statements which had been made foreshadowing the reconstruction of the Air Service in the direction of a new fighting arm, he could make any statement as to the scope of the proposed scheme; whether the appointment of a chief of the new Service had yet been made; and whether the House would have an early opportunity of discussing the whole question.

Mr. Bonar Law: A Bill dealing with the constitution of an Air Ministry has been prepared and will shortly be introduced. This will give an opportunity to discuss the subject. In the meantime General Smuts will continue to supervise our Air Service. There is certainly no delay taking place in consequence of reconstruction. The policy of the Government was clearly stated for the Cabinet by General Smuts, and I have nothing to add. It is our intention to employ our machines over German towns so far as military needs render us free to do it. Our action depends upon what we consider the best use of our resources for damaging the enemy.

Reward for a Zep. Strafer.

It was announced on October 11th that the King has been graciously pleased to approve of the award of the Military Cross to Lieutenant WILLIAM WALLACE COOK, N.Z. Forces and R.F.C. For conspicuous gallantry and skill in an attack on a Zeppelin. He ascended from his station during strong wind, thick mist, and low clouds, and showed great determination, eventually giving up the attack when 60 miles out to sea. His return journey was hazardous, but with great skill he eventually effected a landing in a field within a quarter of a mile of the coast, having been in the air for 5½ hours.

Fatal Accidents.

FLIGHT-LIEUT. B. W. HORSWELL, R.N., was "accidentally killed while flying a seaplane on October 11th.

A verdict of "Accidental death" was returned at an inquest held in Outer London on October 11th on the body of 2nd Lieut. J. L. Foubister, who was in training as a pilot. The evidence showed that 2nd Lieut. Foubister was instructed not to attempt to turn until he had reached a height of 1,000 ft., but when he was about 500 ft. up he turned, and a gust of wind caught his machine, which fell into a field.

A verdict of "Accidental death" was returned on October 12th in Lincolnshire at an inquest on 2nd Lieut. C. R. Bascombe, R.F.C., who was killed while flying on October 10th.

An inquest was held at Croydon on October 13th on Capt. C. S. J. Griffin, Gord. Highrs., att. R.F.C. On October 11th while leaving a Surrey aerodrome, his engine misfired at a height of about 150 ft. He tried to turn, but the wind caught the tail of the machine, which nose-dived. He was too near the ground to be able to recover, and his injuries in the smash proved fatal. A verdict of "Accidental death" was returned.

A double fatality occurred on the South Coast on October 13th. Capt. M. Mackenzie, R.F.C., and Capt. A. Gerbe, of the French Flying Service, who had come over to study British methods, were up together when the machine nose-dived and crashed to earth. Both officers were picked up alive, but died almost immediately.

2nd Lieut. A. De Teissier met with a fatal flying accident in South-East Essex on October 12th. He was descending from a height of only 150 ft. when the machine side-slipped and crashed to the ground. The pilot died on the way to hospital.

A pilot instructor, S. G. Cownie, was accidentally killed while flying.

SOUND WAVES.

By S. T. G. ANDREWS, B.Sc. (Eng.), Lond.

THE following article, which sets forth with admirable clearness the fundamental principles of sound propagation, should form a good basis for a discussion of the reasons for the change in pitch of the sound of an approaching or receding aeroplane. According to fundamental laws the note should, as pointed out in the article, rise as the aeroplane approaches the observer, and fall as the machine travels away. In practice this does not appear to be so, most observers being quite certain that the reverse is the case. With the present article as a basis it should be quite possible to ascertain and explain why the noise of an aeroplane appears to differ. We say appears, as the noise itself if composed of waves from a single source must follow the fundamental laws. Personally we are inclined to think that the reasons that have led some correspondents to state most emphatically that the sound falls with the approach and rises with the retreat are that the general note emitted by an aeroplane is composed of two main notes, one coming from the engine and the other from the passage through the air of the various parts of the machine. The higher note probably carries farther than the deeper one; therefore at a distance the higher note is heard over and above the lower. As the machine approaches the lower note becomes more audible and finally predominates the higher. We should, however, like to hear other correspondents' views.—ED.

As the question as to whether there is or is not an increase of pitch in the note emitted as an aeroplane approaches an observer appears to be of somewhat general interest, it has occurred to the writer that a few notes on the propagation of sound waves will be generally appreciated by readers of "FLIGHT."

In order to prevent misconceptions arising from a loose or improper use of terms, the exact significance of the terms used will be defined in all cases. The ear is the organ by means of which we appreciate the sensations of sounds. This organ is a very complex structure, and as authorities differ as to the exact manner in which the various parts act, no attempt at a description will be made here. We know, however, that we can readily distinguish with our ears the sound sensations of pitch, quality and loudness. Pitch is the difference existing between different notes, as

The loudness of the ordinary noises of the London streets is usually unnoticed by the average Londoner.

The simplest types of waves are transverse and longitudinal.

Let the arrow in Fig. 1 represent the direction in which the waves are travelling. If we divide up the medium through which the waves are travelling by means of a series of equidistant lines 1, 2, 3, 4, 5, 6, 7, &c., then the motion of each of these successive layers would be up and down perpendicular to the arrow in the case of transverse waves, and to and fro parallel to the arrow in the case of longitudinal waves. It can be shown that sound waves in air are of the latter, that is the longitudinal, type. The usual graphic method of representing air waves will probably enable the reader to realise much more clearly and effectively the exact conditions realised in the various parts of an air wave.

In Fig. 2, A, B, C, D, E, &c., represent the initial position

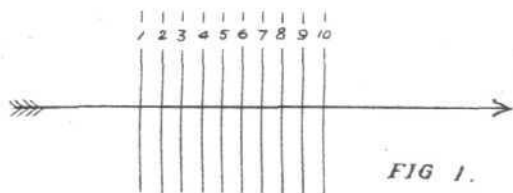


FIG. 1.

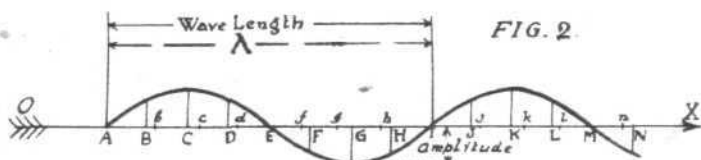


FIG. 2.

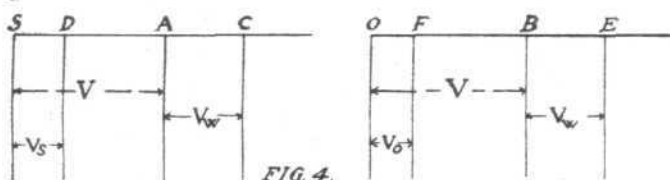


FIG. 4.

for example, between a bass note and an alto note. The former is said to be lower in pitch than the latter. All musical sounds have a definite pitch, but some sounds, such as street noises, gun reports, &c., have no definite pitch. In the first case there is a vibrating source which sends out regular waves, and by experiment we can show that the pitch of the note heard by the ear depends upon the number of waves reaching the ear per second. The number of waves which reach the ear per second is termed the frequency of the sound, so that the same pitch will always correspond to the same frequency, whatever may be the source of the sound. There is, however, a considerable difference between the note produced by, say, a piano and the same note as produced by the human voice. They are both of the same pitch and frequency, but they differ considerably in quality. We shall see later how sound waves can give rise to notes of the same pitch and frequency, but of variable quality. Loudness of sound sensations depends upon the amplitude of the waves, and is largely influenced by accompanying conditions. For example, the air-raid warning sirens recently tried in Central London would have been thought to be very loud indeed by those in the immediate vicinity, but their sound sensation was entirely lost amidst the traffic noises always prevalent in London during the daytime.

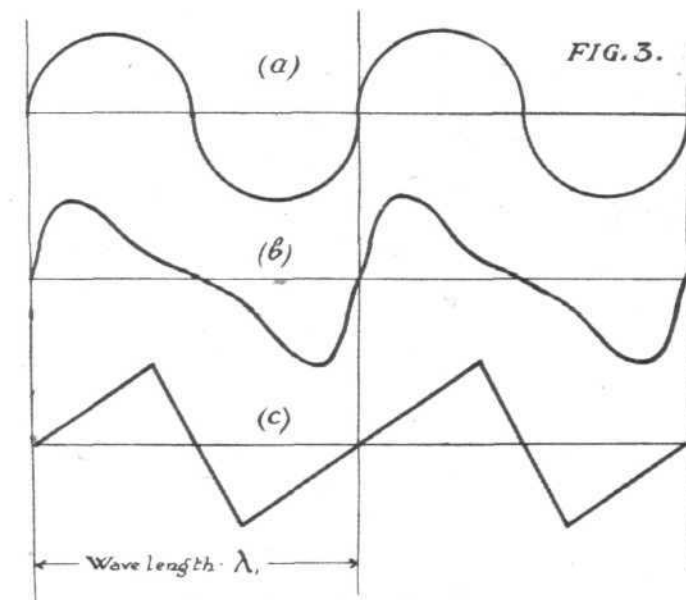


FIG. 3.

of the particles in the direction of motion of the sound waves before disturbance. Then, at some instant when the wave is passing, the positions of these particles will be displaced into some such positions as A, b, c, d, E, f, g, h, &c., where distances like Bb, Cc, Dd, fF, gG, hH, &c., represent the displacement of the particles from the positions originally occupied. At B, C, D, &c., ordinates are erected perpendicular to OX and proportional to Bb, Cc, Dd, &c., respectively. These ordinates are drawn above OX for forward displacements such as Bb, and below OX for backward displacements such as fF. By joining the ends of these ordinates we obtain a curve as shown in Fig. 2. It must be clearly remembered that the ordinates of this diagram represent forward or backward displacements in the direction of OX, and that they are merely drawn at right angles to OX for convenience. Bearing this in mind, longitudinal sound waves in air can be graphically represented as shown in Fig. 2.

It will be observed from Fig. 2 that at some point such as I the wave is about to repeat itself. The distance AI is called the wave length and is denoted by λ. If the velocity of the waves forward is V and n is number of waves which pass a given point per second, then a length V of the displacement diagram would contain n waves. Hence we have the relationship that $V = n\lambda$.

To an observer stationed at I, n represents the frequency

of the note that he hears. Thus we have three variables, namely, wave-length, amplitude and wave-form. It is obvious that when both the wave-length and the amplitude are the same, that there is still a considerable latitude remaining for the alteration of wave-form. The wave-length, as we have already seen, determines the frequency or pitch of the note heard; the amplitude determines the loudness of the note; while the third variable wave-form determines the quality of the note.

Fig. 3 shows the displacement diagrams for a note of equal wave-length and amplitude produced by three different sources—

- (a) being produced by the piano.
- (b) being produced by an open organ pipe.
- (c) being produced by a violin string.

Now the velocity with which a wave-form travels relatively to the air when it has once been produced will be unaffected whether the source that produced it, or the observer that hears it, is stationary or moving, or whether the air in which it has been produced is stationary or moving. Suppose now that the aeroplane engine is producing a note of frequency n . Let V feet per second be the velocity with which these waves travel relatively to the air, and let the component of the velocity of the aeroplane in the direction of the observer be v_s , which of course may be either positive or negative according as to whether the aeroplane is moving towards or away from the observer. At the end of $1/n$ seconds, when the engine is about to emit its second wave the first wave must have travelled V/n ft. while the aeroplane will have travelled v_s/n ft. towards the observer. Hence the first wave in the direction of the observer has a start over the second wave of $(V - v_s)/n$ ft. This, therefore, must be the length of the waves travelling in the direction of the observer. Hence, when v_s is positive, that is when the aeroplane is approaching the observer, the frequency of the note heard must rise, and when v_s is negative, that is when the aeroplane is receding from the observer, the frequency of the note heard must fall.

Again, to consider the effect of the wind in addition, and also movement on the part of the observer. Let S and O in Fig. 4 represent the positions of the aeroplane and observer. Let $SA = OB = V$. After 1 second the wave from S will have reached C, but the aeroplane meanwhile will have travelled to D, while if the component of the velocity

of the wind in the direction of motion towards the observer is v_w , then the wave-form will move in addition from A to C, due to the influence of the wind. Hence the n waves per second emitted must be contained in the distance CD, and from Fig. 4

$$\begin{aligned} CD &= SC - SD. \\ &= SA + AC - SD. \\ &= V + v_w - v_s. \end{aligned}$$

Next, considering the observer, we have the waves in the length FE as the length received per second by the observer, and

$$\begin{aligned} FE &= OE - OF. \\ &= OB + BE - OF. \\ &= V + v_w - v_o. \end{aligned}$$

The n waves emitted per second by the source are contained in the distance CD and are received in the distance FE. Then the number contained in the distance FE, will be $n \times \frac{FE}{CD}$, which by substitution equals $\frac{n(V + v_w - v_o)}{(V + v_w - v_s)}$,

and this is the frequency of the note heard by the observer. This last equation is the complete mathematical expression for Doppler's Principle, and will enable us at once to state whether the pitch or frequency of the note emitted will rise or fall as heard by an observer, when we know the velocities concerned. We can at once see that if both source and observer are moving with the same velocity then the pitch is unaltered. Again, the effect of the wind is to lessen the change of pitch when blowing in the same direction as the aeroplane is travelling, and to increase the change in pitch when blowing in the opposite direction.

All possible conditions can be investigated from this equation, but as the velocity of sound in air is roughly 1,100 ft. per second, or say 750 m.p.h., it would be impractical to consider what the effect would be if v_s , the velocity of the aeroplane, were greater than V , although any reader sufficiently curious can easily do so.

It may be of interest to mention that Doppler's Principle, outlined above with reference to the change in the pitch of the note emitted by an approaching and receding aeroplane, has been applied by Sir William Huggins to solve the problem of ascertaining the motion of the fixed stars to and from the earth, and of our motion relatively to them in the line of sight; a problem which had previously been declared to be insoluble for all time.

CORRESPONDENCE

Parachute Velocity.

[1950] Being interested in the question of air resistance, I should like to offer the following comments on an article on "The determination of parachute velocity" appearing in the current issue (No 455) of "FLIGHT." There are a few errors which it is necessary to point out, viz. :—

The total pressure (whereby is apparently intended the total force resisting motion) is given by $Z\rho V^2 A + PA$, not $\frac{Z\rho V^2 A}{g} + P$ as stated in the text and shown on Fig. 2.

The downward acceleration is obviously given by $g - \frac{Z\rho V^2 A}{m}$, not by $g - \frac{Z\rho V^2 A}{g}$.

There is no increase in velocity when the resistance is equal to the weight, that is when $mg = Z\rho V^2 A$, so that the the maximum velocity $= \left(\frac{mg}{Z\rho A}\right)^{\frac{1}{2}}$. The article omits m .

It is necessary to attach much importance to these errors, as slips of this nature are easily made, and the careful reader will doubtless have noted them for himself.

The article is based on the assumption that "for practical purposes" the pressure on a curved surface is the same as the pressure on a plane surface having an area equal to the "projected" area of the curved surface. This is assuming that a parachute of umbrella form is no more efficient than a flat disk would be, and presumably, also, than a curved parachute falling convex side first would be, provided that the projected areas are the same in the three cases. Is this assumption really justified by practice? If so, why does the ordinary anemometer having hemispherical cups trouble to rotate?

The article proceeds to show that the velocity of fall is

given by $V^2 = K^2 \left(1 - e^{-\frac{2gx}{K^2}}\right)$ and states that "for practical purposes when the parachute reaches the ground its velocity is given by K ." This is only true when $e^{-\frac{2gx}{K^2}} = 0$, i.e., when $x = \infty$ or $K = 0$. The latter condition is ruled out as indicating that the parachute is not falling at all. Thus it is assumed that for practical purposes the parachute may be considered to have fallen so far that not only does it reach the ground with maximum velocity, but it may, without appreciable error, be taken to have fallen with this velocity all the way. If this assumption be justified in practice, is it really necessary to use a differential equation to

show that $\left(\frac{mg}{Z\rho A}\right)^{\frac{1}{2}} = \sqrt{\frac{m}{\frac{Z\rho A}{g}}}$ and that the velocity of a body moving with uniform velocity a distance h in time t is $\frac{h}{t}$?

The statement immediately below Fig. 2 should apparently read "This formula holds only when the height from which the parachute falls is very large."

The article concludes by stating that the calculated value of V should be "corrected" by adding .0002 V . It is not clear why this "correcting factor" is needed, nor how it is arrived at, but why use a correction of this order, seeing that it makes the difference between the calculated and corrected velocities merely equivalent to the difference between the velocities attained by a mass falling freely from, say, a height of 180 inches and a height of 100.04 inches?

[A. E. WATSON.]

To Readers—One and All.

THE Editor of "FLIGHT" will at all times be pleased to consider original articles (illustrated or otherwise) on subjects directly or indirectly allied with aviation. All articles

accepted will be paid for; a high literary standard of writing is not essential; it is the facts which matter. Practical explanatory articles are most acceptable. Diagrams and similar illustrations need only be rough sketches if necessary.

WING BRACING AND HEAD RESISTANCE.

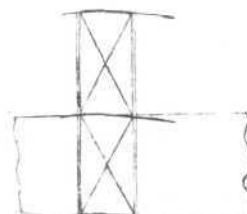
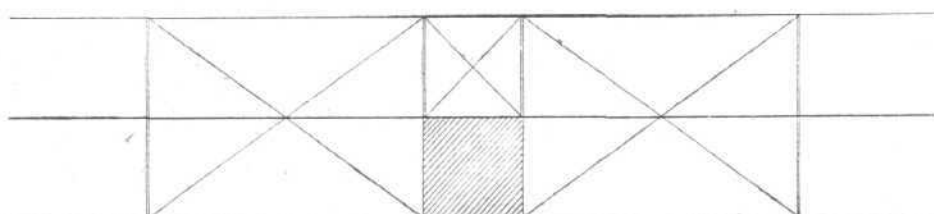
By MARCO POLO.

(Continued from page 1049.)

HAVING examined, in previous instalments of these notes, various types of wing bracing for biplanes, it may be of some interest before concluding to see how the wing bracing of a triplane can be most economically effected, and how such bracing compares with that of the more generally employed biplane. As has been amply demonstrated in actual war practice, notably by the Sopwith triplanes, this type of machine is capable of excellent performances, while at the same time offering certain practical advantages, from the pilot-gunner's point of view. One characteristic of the triplane, which would lead one to expect that

amounts in this type to 36 ft., while the total length of wires is found to be 140 ft. 8 ins. This gives a resistance factor of 212.7, which is not, it will be seen, nearly so good as that found for some of the biplanes. It is, however, better than the two struts each side biplane, which had a resistance factor of 283.

As already pointed out, the small chord of a triplane allows of employing, with a reasonable factor of safety, single struts of the "K," "I," or "X" type, and the next step will therefore be to examine how such a wing bracing works out as regards resist-

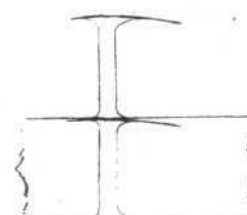
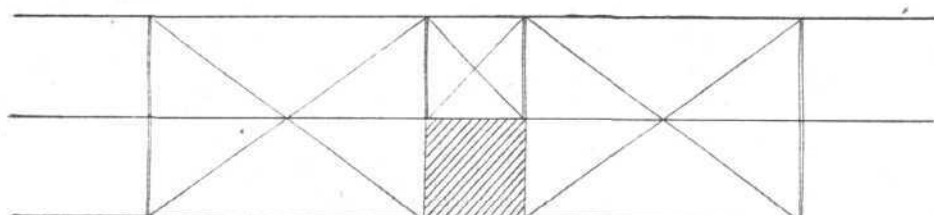


TYPE	UPPER WING	LOWER WING
SPAN	28	28
CHORD	3'-6"	3'-6"
AREA	98 sq. ft.	87 sq. ft.
TOTAL AREA	273 sq. ft.	
GAP	3'-0"	
TOTAL LENGTH OF		
STRUTS	36'-0"	
WIRES	140'-8"	
RESISTANCE FACTOR	212.7	

Fig. 9.—Diagram of triplane wing bracing.

from considerations of head resistance the bracing of a triplane would offer certain advantages, is that by splitting up the wing area into three instead of two planes the chord can be kept considerably smaller than in the case of the biplane, with a consequent reduction in the travel of the centre of pressure. This again is only another way of saying that single struts of the "K," "I," or "X" type may more readily be made strong enough to take care of the travel of the c.p. without the employment of incidence wires. In the triplane, as in the case of the biplane, the internal wing bracing has its load increased by the travel of the c.p., but in the former the bottom plane is

ance. Fig. 10 is a diagram of this bracing. As in the previous example the span of all planes is 28 ft., and chord 3 ft. 6 ins. Only one lift wire and one landing wire are employed, and the inter-plane struts are of the "I" type. The total length of struts is in this case 18 ft., while there are 49 ft. 3 ins. of wires. Assuming the resistance of the "I" struts to be 2.5 times that of the stream-line wires, a resistance factor of 94.25 is arrived at. This is excellent, compared with the other types of bracing for triplanes, and only very slightly higher than that of the Curtiss "wireless" type biplane bracing, which was, it may be remembered, found to be 80. After finding such



TYPE	UPPER WING	LOWER WING
SPAN	28	28
CHORD	3'-6"	3'-6"
AREA	98 sq. ft.	87 sq. ft.
TOTAL AREA	273 sq. ft.	
GAP	3'-0"	
TOTAL LENGTH OF		
STRUTS	18'-0"	
WIRES	49'-3"	
RESISTANCE FACTOR	94.25	

Fig. 10.—Diagram of triplane bracing of the Sopwith type.

working "at a longer leverage," hence, although the spars are also situated closer together on account of the smaller chord, the triplane bracing may conceivably be better structurally when single struts are employed. In the Sopwith triplanes single lift wires are employed, and one has not heard of these machines being inferior, from the point of view of strength, to the biplane type.

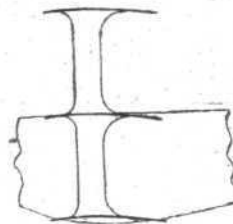
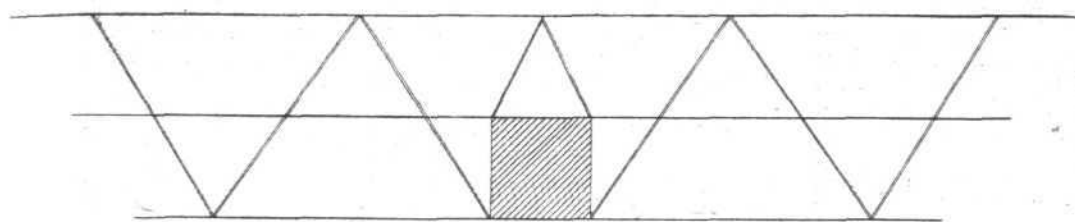
In Fig. 9 is shown the bracing of a triplane, with the ordinary bracing, that is to say with two lift wires, two landing wires, and two incidence wires. The span is 28 ft. for all three planes, which, with a chord of 3 ft. 6 ins., gives a total wing area of 273 sq. ft., or 8 sq. ft. more than the standard area chosen for the biplanes. By slightly reducing the chord, the area could be brought down to the standard 265 sq. ft., but the small difference is not thought to have any appreciable influence on the bracing. The total length of struts

a low resistance factor for the single strut triplane it is not difficult to see the reason, or at least one of them, for the popularity of the Sopwith triplane, which belongs to this type.

Having found, in the case of the biplane, that the single strut Warren truss bracing was very good as regards resistance, it may be of interest to see how this form of bracing would work out when applied to a machine of the triplane type. The diagram in Fig. 11 shows how such a bracing would look, and does not from the start inspire any great hopes with regard to the application of the Warren truss for triplanes, since, no matter how the resistance works out, the strutting of the centre plane is excessive, entailing piercing of the centre plane in numerous places whether or not all intersections are made anchorages for the struts. On adding up the total length of struts this is found to be 49 ft. 8 ins., which, with a resistance value of 2.5 for the "I" struts,

gives a resistance factor of 124.25. This is in itself quite good, but taking into consideration the awkwardness of the strutting, will hardly commend itself to designers, especially as the resistance factor is very considerably higher than that found for the Sopwith type triplane bracing shown in Fig. 10. It would appear that the only thing which might justify the adoption of this form of bracing would be the possibility that the short lengths of struts, owing to the intersection with the centre plane, might allow of making these of a smaller section, thus bringing the

lower main spars at the point where these are attached to the inter-plane struts. The free lengths and overhangs are, generally speaking, the same as those of the Sopwith type, hence, there would not appear to be any structural gain attending the employment of the wireless bracing, except for the strut to the hub of the wheels, which, owing to its forward slope, would relieve the internal bracing of the bottom plane to a certain extent of the drift and also of the load imposed by the backward travel of the c.p. of the upper planes.



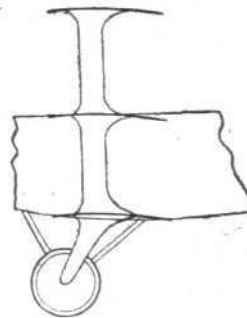
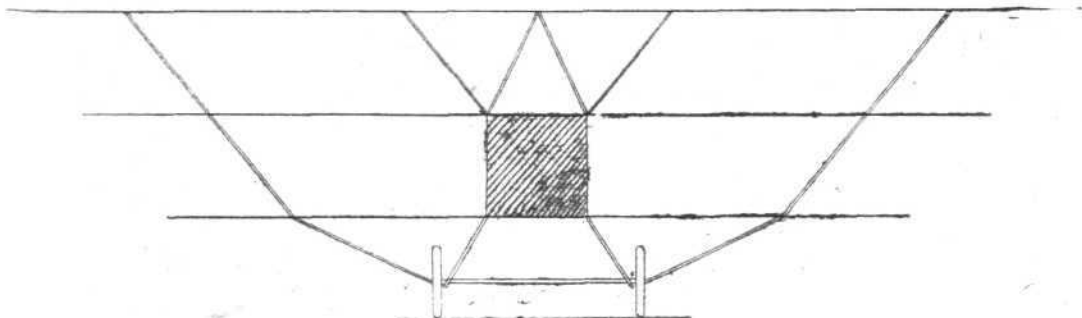
TYPE	UPPER WING	LOWER WING
WT	WT	WT
SPAN	32'-0"	28'-0"
CHORD	3'-6"	3'-6"
AREA	112 sq. ft.	87.5 sq. ft.
TOTAL AREA	273 sq. ft.	
GAP	3'-0"	
TOTAL LENGTH OF		
STRUTS	49'-6"	
WIRES		
RESISTANCE FACTOR	123.25	

Fig. 11.—Diagram of Warren truss triplane bracing.

resistance down to, or nearly so, that of the ordinary inter-plane strut. This is doubtful, however, and although the free length of spar with this arrangement is shorter, near the root where the load is greatest, than that of the Sopwith type, while that of the bottom spars is approximately the same, it is unlikely that the Warren truss triplane bracing will ever become popular.

When dealing with the bracing of biplanes it was found that the Curtiss "wireless" form had by far the lowest resistance factor of any found for biplane bracings. It would therefore appear possible

Now as regards the resistance of this structure. The total length of struts is found to amount to 39 ft. 4 ins., so that, assuming, as before, that the resistance of the "I" struts is 2.5 that of the stream-lined cable, the resistance factor will be 98.25. It therefore appears that, everything considered, the Sopwith type of triplane bracing is capable of holding its own from every point of view against any other of the different forms of wing bracing that have come under inspection. It might be found possible to devise some form of bracing of a quadruplane that would reduce this resistance factor, but since com-



TYPE	UPPER WING	LOWER WING
WT	WT	WT
SPAN	32'-0"	27'-0"
CHORD	3'-6"	3'-6"
AREA	112 sq. ft.	86.4 sq. ft.
TOTAL AREA	262.4 sq. ft.	
GAP	3'-0"	
TOTAL LENGTH OF		
STRUTS	39'-4"	
WIRES		
RESISTANCE FACTOR	98.25	

Fig. 12.—Diagram of "wireless" type triplane bracing.

that it might prove equally advantageous for triplanes. Fig. 12 shows one arrangement that suggests itself.

The roots of the two top planes are attached to a *cabane*, while the free length of spar is reduced by having half-struts sloping out from the upper *longerons* of the body, much after the fashion of the original Sopwith one-and-a-half-strutter. The inter-plane struts slope outwards as in the Curtiss "wireless," the spans of the three planes being 32 ft., 27 ft. and 22 ft. respectively, while another strut connects the hub of the landing wheel with the

paratively little is at present known regarding the aerodynamic qualities of the "quad," and the few built during the war have not, apparently, been so successful as to supersede other forms of multiplanes, their performance can hardly have been such as to encourage progress along these lines, and it does not therefore seem worth while to go into the question of their bracing. In saying this the writer is, of course, referring solely to machines of the standard area used in these notes, and not to large machines, future ones of which may quite conceivably be of the quadruplane type.

Reward for Bombing Berlin.

IN view of the King's Regulations not permitting any pecuniary reward being offered to any member of His Majesty's forces for the execution of his duty Mr. W. H. Veno, of Manchester, has modified his offer of £1,000 to the British aviator who drops the first bomb on Berlin. He will give the amount to any war charity which the aviator who drops the bomb may nominate.

Guynemer Avenged.

SOME details of how Lieut. Wissemann, who is said to

have shot down Guynemer, was brought down by Lieut. Fonck, a comrade of Guynemer, have been published in Paris. While flying on September 30th at a height of 7,000 ft. Lieut. Fonck was attacked by a German two-seater. Having avoided the first rush, he got behind the German machine and opened fire from below. The pilot, subsequently found to be Wissemann, was shot through the head and fell out of the machine, while the observer was also killed.

Lieut. Fonck is credited with 15 victims, five of which were shot down in six days.

AIRISMS

FROM THE FOUR WINDS

Now that the Huns have got a footing on the Riga Bay Islands, it may well be time for Petrograd to organise its air-raid defences.

LOOKS as if there is likely to be liveliness up East Islington way, following the Parliamentary vacancy in that borough, brought about by the death of Sir G. Radford. With three candidates in the field, in normal times party feeling would run fairly high. With the added zest of Mr. Pemberton Billing's whirlwind campaign in support of his mysterious "bombs on Germany" candidate, a member of the P.B. "Vigilantes," proceedings electoral should hum some. "P.B." and his candidate are in earnest without doubt, and the "Vigilantes" may with smart organisation, stand a fair chance against Mr. Smallwood, the coalition Government nominee, and the new "National" Party champion, Mr. E. B. Barnard. Indecision may well arise as between the "National" and the "Vigilante," as apparently the objects of both are, on paper at least, broadly identical.

WHAT a "Vigilante's" mission in life is, may be explained briefly. Each member is one of a number of aspirants for Parliament who are to be put forward by an association founded by Mr. Pemberton Billing under the name of "Vigilantes," with the declared object of returning to Parliament not more than nine independent men, each with an intimate knowledge of a particular Department of State, which he is to watch, and each solemnly pledged not to accept any honour or office in the disposal of the Government. The principles in question have our very warmest support and appreciation as helping to purify the cesspool of party politics. We can only hope that out of one or the other, some sort of reformation of the present vicious political system may be effected. Necessarily, "funds" must be available from somewhere for spade work of this description, and therefore, in accordance with the constitution of the "Vigilantes," the Council of Parliamentary Lodge Number One (British) have formally applied to all members of the "Vigilantes" to send to the treasurer the first election levy of 1s. towards the expenses of contesting the seat. This method of supporting the cause is frankly open, although the thought

arises, that there must already be a deuce of a lot of full-blown "Vigilantes" if the "whirlwind" campaign is to materialise to any serious extent at one shilling a head.

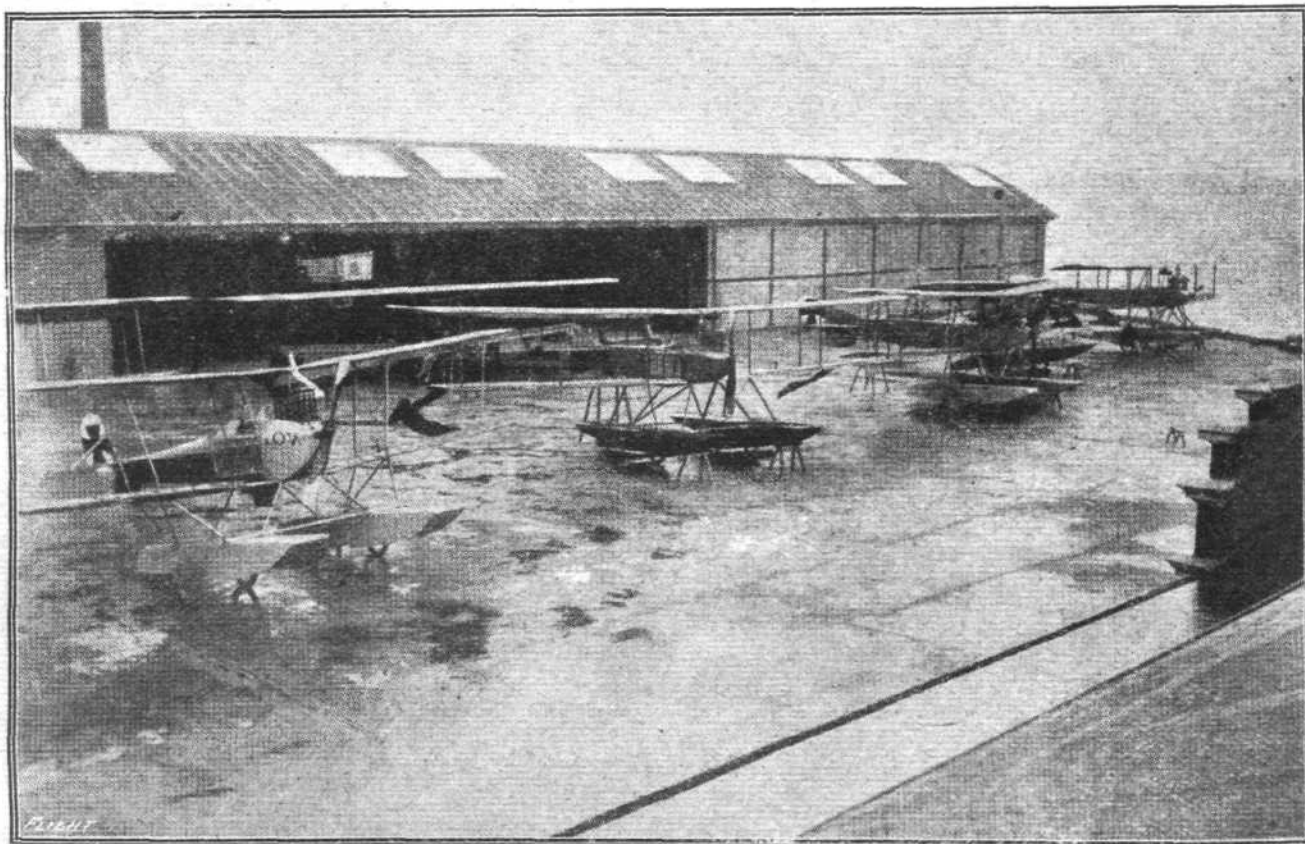
ONE Australian way of promoting the Liberty War Loan has much to commend it. Three Federal aeroplanes have been dropping leaflets over Melbourne, setting out the attractive features of the Loan and inviting subscriptions from one and all. In the old country, perhaps, we are by now too used to the aeroplane as part of the landscape for a similar "stunt" to carry much weight.

How unexpected and rapid was Gen. Maude's movement upon and capture of Ramadie last month may be judged by a short despatch recently received by the *Daily Telegraph* from their war correspondent, Mr. Edmund Candler. He describes how all attempts of the enemy to break through were crushed, and so leakage of the news to the Turks of the smashing victory was very restricted. So much so that even the next morning the Turks on the Tigris must have still been in ignorance of the defeat of their army, as a Turkish aeroplane flew very low over the camp and apparently was about to descend, when the pilot discovered the change in the occupation and made off, pursued by a volley of rifle and machine gun fire.

CHAIRMAN of St. Pancras Tribunal: "What national work are you doing?" Applicant (B 1): "Rearing eight children and helping to make aeroplanes." Case adjourned. Surely a case of doing double National service duty!

SHEFFIELD has to itself, so far, the record for attendance and receipts in connection with the official Air Services Exhibition, which has been a round of the chief towns in the provinces, under the guidance of the Countess of Drogheda. 44,255 was the total number of visitors to the Cutler's Hall, and the Flying Corps Fund and other charities will benefit to the extent of over £1,281 as a consequence.

LIKE most other war operations, the Hun's method of organisation is distinctly emphatic in its *verbosens*, and



OUTSIDE A GERMAN SEAPLANE STATION.—Detachable wheels are placed under the floats for transport down to the water.

moreover the announcement of these regulations appears to bring grist to the coffers of the German newspapers, as bold space is given to them in their advertisement columns; in the case of the *Frankfurter Zeitung* over 12 inches of a 3½ inch column is occupied by the police notification regarding precautions against air-raids. Here the editorial departments have the privilege of spreading the news gratuitously. The following is a translation of what the Frankfurt police think about the possibilities in air-strafting by the Allies. Miss Hun Dora, it will be noted, ensures compliance with the *verbodens* by the definite promise, for non-compliance, of a year's imprisonment or £75 fine "and/or arrest":—

"POLICE NOTICE.

"Precautions against Air Raids.—In accordance with par. 5 and 6 of the Highest Imperial Law of . . . &c., &c., the following regulations have been drafted by the police authorities for the Frankfurt/M. District

"I. Everyday Precautions.—Par. 1.—All room openings (such as windows, doors, skylights, &c.) communicating with artificially illuminated interiors (such as dwelling-rooms, staircases, workshops, factories, restaurants, shops, &c.), whether facing the street or overlooking gardens, courtyards, &c., must after the approach of darkness be efficiently shaded by means of Venetian blinds, dark curtains, opaque paint or other suitable means.

"Par. 2.—All lights in the open are forbidden, unless specially authorised by the police.

"Special regulations governing the lighting of public service vehicles are being issued by the police.

"Par. 3.—The use of electric pocket lamps and similar small lights in the open is permitted.

"The regulations governing the lighting of vehicles and cycles remain in force, these stipulating that such vehicles shall carry efficient lamps, which shall also be attached to all obstructions on or in the public thoroughfare.

"II. Special Precautions after a Raid Warning has been given.—Par. 4.—(1) All assembling of persons in public squares or streets is forbidden.

"(2) The occupiers of the lowest situated tenements, or in their absence the occupiers of the next lowest, must open their doors for the admission of all persons desiring to take shelter.

"(3) The electric current is to be cut off from the electric tramways.

"(4) All vehicles on the streets must remain stationary and extinguish all lights.

"Par. 5.—Infringement of the Lighting Regulations involves liability to a maximum penalty of one year's imprisonment, or in less serious cases to a fine up to 1,500 marks (£75) and/or arrest.

"Infringement of the remaining regulations involves punishment by fines up to 30 marks (30s.), or in default imprisonment.

"VON RIETZ, Chief of Police,
"Frankfurt/M. "September 8th, 1917."

THERE is one regulation they have forgotten; to provide a penalty against spreading false air-raid alarms—whether with the object or not of more easily robbing houses—like unto that inflicted last week upon one Michel Flaum (there's a strong Scotch flavour about that name) at the Thames Police Court: to wit, six months with hard, and a fine of £40. Appears to be rather an expensive amusement, if indulged in too often.

PROBABLY no journalistic work during this war has carried more weight with it than the remarkably vivid articles to the *Daily Telegraph* from the pen of the late Mr. G. J. Stevens, who during a brief visit recently to this country from Greece, was one of the victims of the Gotha night-raiders during the harvest moon. There will be a very great many therefore who will applaud the graceful act of the Greek Government, who are passing a Bill allowing a pension to be granted to the daughter of Mr. Stevens, for services rendered to Greece by the English journalist. Readers of *FLIGHT* will recall the many extracts which from time to time have appeared in these pages from Mr. Stevens' articles.

A NOTE is to hand from Mr. Arthur Sexton, General Secretary of that very sound body, the National Society of Chauffeurs, reminding us of one way in which the Society is doing its little bit at home. It has collected from soldiers, sailors, and munition workers, over 5,000 sixpences towards the funds of the Central Committee for Employment of Discharged Soldiers and Sailors connected with the motor and aircraft industries. The fund is steadily increasing, and this effort of labour is much appreciated by the Executive Committee at 83, Pall Mall, at which address

all discharged men connected with the motor and aircraft industries should register for employment.

THE *Cologne Gazette* recently published extracts from reports in the British Press of the air raids on London, under the heading "The Rage of the Helpless," and with the following comment:—

"For three nights in succession London experienced the fury of German air attacks, and the giant city, as is clear from all reports, had a spectacle which is quite unique in its history and of which the most imaginative Londoner had never dreamed. Great London, 'the mother of cities,' the capital of the greatest world-empire, bombarded by the Germans! The sense of shame is even greater than the anger of the English; the anger rages in numerous proposals for revenge, which make sober people shrug their shoulders, while the military experts advise against them. . . . The World-Empire is not in a position effectively to defend its capital."

QUITE so, and presently we propose printing from the *Cologne Gazette* their views upon the bombing of Cologne. Moralising assumes some quite unexpected forms, when it is begotten of practical experience.

MR. G. HOLT THOMAS, the genius of aircraft organisation and construction, by securing the co-operation of Lieut.-Col. Mervyn O'Gorman in his comprehensive series of commercial undertakings dealing with aircraft construction in all its ramifications, has added one more claim to recognition as a past-master in gathering round him brains and ability, always tending to the best service to the Empire, not only in helping to success in this war, but in founding on an unassailable basis the future of the aircraft industry. Lieut.-Col. O'Gorman is not merely a theorist, he is an engineer with far-ahead practical views. It is fortunate in the new association that his services will still be devoted with the utmost energy to the benefit of the nation.

TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of October, 1907. "FLIGHT" was founded in 1908.

"NULLI SECUNDUS"—THE THIRD FLIGHT.

On Monday, Sept. 30th, the British military airship made its third flight, during which it accomplished, in a most successful manner, a voyage of some 16 miles, remaining in the air for nearly an hour. As on the initial trials, which took place



(From *Het Vliegveld*.)

A Fighting Squadron, under the command of Von Richthoven, ready for starting on its work.

on September 10th, Col. Capper, R.E., was in command, and Mr. Cody acted as engineer.

"NULLI SECUNDUS" TRAVELS TO LONDON.

October 5th was another red-letter day in the annals of aeronautics, for it was the occasion of the first trip of "Nulli Secundus"—whose official title, by the way, is "Dirigible I"—to London. Precisely at noon the vast crowds in the thoroughfares of the Metropolis were surprised and delighted to see floating bravely above their heads Britain's first military airship, which had sailed over from Aldershot in order to pay a surprise visit to the capital. The following is a summary of the performance accomplished by "Nulli Secundus" on Saturday:—Left the shed at Aldershot about 10 o'clock, started the flight about 10.45, reached Kensington Palace at 12 o'clock, passed round St. Paul's and over the river to the Crystal Palace, where a descent was made just before 2.30. Average speed about 24 miles an hour while going with an 8-mile-an-hour wind. The gas-vessel was holding 54,000 cubic feet of hydrogen. and the total weight carried was 3,400 lbs. Seven gallons of petrol were consumed and one gallon of lubricating oil.

THE ARMY AEROPLANE.

Progress continues to be made with the aeroplane which a little isolated section of the British Army encamped in the Scottish Highlands, at Glen Tilt, is constructing. Naturally enough, the secrecy which has enshrouded operations at Glen Tilt has proved a strong attraction to foreign spies, and several gentlemen of this persuasion, it is stated, have been caught in the vicinity, and relieved of such ingenious

appliances as telescope walking-sticks and long-distance cameras.

MALECOT AIRSHIP.

While practising at Meaux on Monday of this week, M. Malecot's new airship got out of control, and was smashed to pieces, M. Malecot himself, with the proverbial luck of an aeronaut, being unhurt.

THE PISCHOFF AEROPLANE.

M. de Pischoff, who has for some considerable time past been deeply interested in the academical side of aeronautics, and has contributed scientific articles on the subject to the technical press of France, has now come forward with a full-sized machine, with which he will shortly make experiments.

THE ZEPPELIN AIRSHIP.

During a trial over Lake Constance, which took place on Tuesday, September 24th, Count Zeppelin succeeded in manœuvring his airship during a period of 4½ hours, in which time he covered a distance which must have been well over 50 miles. On September 30th the airship rose from the shed at Manzell at eleven o'clock, and never descended from its natural element until a quarter past eight that night, when it effected a most successful landing on the same spot in the dark. During the nine and a quarter hours that it was aloft it covered a distance of some 200 miles, visiting most of the places around Lake Constance, and travelling from one to the other at a speed which must have been fully equal to 30 miles an hour. The wind, moreover, was stronger than during any former test, and yet this airship never seemed to have the least difficulty in making headway against it.

■ Answers to Correspondents. ■

[As a number of letters reach us signed with initials only, some of which do not give a complete address, we would point out that such communications cannot be dealt with in our columns. Full name and address, which will not be published, must always be given.—ED.]

Notice to Correspondents in General.

Applications for commissions in the Royal Naval Air Service should be addressed to the Director of Air Services, Admiralty, S.W. The necessary form and conditions of entry can be obtained from the Secretary of the Admiralty.

Applications for commissions in the Royal Flying Corps should be sent to the Director-General of Military Aeronautics, Hotel Cecil, Strand, W.C.

Those who wish to enlist in the R.N.A.S. should apply to the nearest naval recruiting station or to the R.N.A.S. Drafting Office, Crystal Palace, S.E. Skilled mechanics are taken whatever their army classification, but unskilled men are only taken if they are classified B1, B2, or C1.

Recruiting for the R.F.C. is closed for the time being, and any enquiries should be made to the Officer Commanding, Royal Flying Corps Depot, Farnborough.

Enquiries with regard to appointments in the A.I.D. should be addressed to the Chief Inspector, Aeronautical Inspection Department, Hotel Cecil, W.C. 2.

E. H. L. C. (Leeds).—We are not allowed to publish scale drawings of British or Allied aeroplanes built during the war, but in our issue of April 25th, 1914, we published scale drawings of the original Bristol scout. Probably those will be found sufficiently near for your purpose, as the alterations are not very great and fairly clear from the picture "Getting Her Height."

H. M. S. (Berkhamsted).—Generically the R.E. 8 is not unlike the B.E. 2E, but the two machines differ very considerably in dimensions, as well as in the matter of engines. That particular S.E. is, we believe, one of the now obsolete S.E. 4's. This machine is a B.E. 2E and has, as you will see in the illustration referred to, two seats.

Wm. L. (Kirkby-in-Furness).—We do not recollect having heard of any contraption called a gyroper. Perhaps what you have in mind is the machine designed by Mr. G. L. O. Davidson and named by him the "Gyropter." Some few particulars of this machine have been published in the columns of "FLIGHT" from time to time, as, for instance, in our issues of November 5th, 1910, February 25th, 1911, and April 15th, 1911. Other information regarding this machine have we none.

G. B. (Bromley).—See note at head of this column.

F. W. L. (Ashford).—(1) R.E. 7, (2) (a) B.E. 12 a; (b) B.E. 2c. (3) We cannot say. (4) The R.N.A.S. "wings" are worn on the left sleeve. (5) This indicates that the machine belongs to the R.N.A.S. (6) The petrol consumption depends, of course, on the size of the engine. A fair average would probably be about .5 lbs. per horse power per hour. That is to say, a 100-h.p. engine would consume something like 50-lbs. (or about 7 gallons) per hour.

F. H. (South Norwood).—The machine with the backward stagger is a de Havilland 5. The other is a Sopwith "Camel."

Capt. (R.F.A., B.E.F., France).—(1) The existing altitude record for an aeroplane of any nationality cannot be stated as it is not permissible to publish particulars of altitude records established during the war. (2) The altitude record for a balloon up to June 30th, 1914, as passed by the F.A.I. is 10,800 metres, and was established by the Germans Suring and Berson, who started from Berlin. The pre-war altitude record for aeroplanes was established by the German aviator Oelerich, who reached a height of 8,150 metres. This record, however, owing to the outbreak of war, was not homologated by the F.A.I. It might be pointed out, that this altitude has since been considerably exceeded, but no details are permissible at present.

F. M. C. (Finchley).—So far as we are aware, no successful helicopter has been built yet. There are various reasons why this is a difficult proposition. In the first place, a direct lift screw, to be efficient, has to be of large diameter, thus presenting structural difficulties. Secondly, with any direct lift machine, there is always the problem of making a safe landing should the engine stop. The screw itself, when stationary, is totally inadequate for doing the duty of a parachute, and some other provision has to be made, which again means further complications and increase in weight. In any case, there would not appear to be any great advantage in the helicopter, even were it feasible to build one successfully. By this we mean for peaceful purposes, since for military use it would obviously be an advantage to be able to hover over an objective while dropping bombs for instance. For peace flying, however, the main object is, after all is said and done, to travel from one place to another, for which the aeroplane would at present appear to be quite reasonably suitable. The helicopter may come along at some future date, but at present there does not appear to be any great prospects of making it a success.

Personals

Casualties.

Second Lieutenant ERIC ARMITAGE, R.F.C., who died of wounds on October 14th was the third son of Geo. Armitage, Westfield House, Rothwell, near Leeds, and was 19 years of age.

Lieutenant FRANK HAMILTON BULLOCK-WEBSTER, Canadian M.G.C., attached R.F.C., who was shot down while fighting an enemy aeroplane on September 20th, and died of wounds the same day, was the eldest son of H. Bullock-Webster, of Auckland, New Zealand, and nephew of Mrs. Allaway, of Llanbedr, Merionethshire. Born in the Waikato, in 1885, he was in British Columbia when war was declared, and immediately enlisted, but was soon given a commission in a Canadian battalion, and came to England in the autumn of 1915. He was transferred to the M.G.C., and went to France in August, 1916, and was invalided home with trench fever in November. When he recovered he was transferred to the R.F.C. He went to the front again last July.

Lieutenant FRANCIS CHARLES ERLIN CLARKE, Worcester-shire Regiment, attached R.F.C., aged 21, who died on October 11th of wounds received in action, was only son of Mr. and Mrs. C. T. Erlin Clarke, of Lark Hill, Worcester.

Second Lieutenant DEREK PERCY COX, R.F.C., returned as missing on August 21st last, is now reported to have been killed on that day, aged 21. He was the only son of Major-General Sir Percy Cox (now on active service as Political Officer) and Lady Cox. He was educated at Harrow, Woolwich and Sandhurst, joined the Machine Gun Corps early in 1915, and remained with this corps until he was transferred to the R.F.C. in May, 1916. In October, 1916, he was invalided home, and after two months' leave rejoined the R.F.C. in England. Having obtained a pilot's certificate he went out to the front again last June, and remained there until his death.

Second Lieutenant CHARLES COWLEY DENNIS, R.F.C., son of Mrs. H. Dennis, of Ilford, was killed on September 25th. Born in 1895, he was educated at Christ's Hospital from 1905 to 1910. He joined the London Irish Rifles in the spring of 1915, and was subsequently granted a commission in the 19th London Regiment. He was wounded in action, came home for a short time, and then transferred to the R.F.C. After a victorious engagement with the enemy he was brought down in "No Man's Land" and instantaneously killed. His body was subsequently recovered by the French.

Captain CONRAD HUGH DINWIDDY, Royal Garrison Artillery, who has died from wounds received in action, was 36 years of age, and was the inventor of the "Dinwiddy" range-finder for enemy aircraft, which was adopted by the War Office. He was Councillor for the Borough of Kensington, and well known as a mountaineer. The gallant officer, who leaves a widow and son, had three brothers in the services.

Second Lieutenant W. J. GAYNER, Somerset Light Infantry, attached R.F.C., reported missing on May 9th, now reported killed on that date, aged 23, was the son of Mr. W. A. Gayner, of Bath, and went to India with the Somerset Light Infantry, but returned to England to take up a commission. Afterwards he went to Mesopotamia, and coming back to Alexandria he passed through the school of flying. Again returning to England he was engaged for some time in training pilots, and he went to the front in April.

Second Lieutenant EDGAR DANIELL GIBSON, R.F.C., was killed on October 9th, aged 19. He was the third and youngest son of Mr. Walter M. Gibson, M.V.O., I.S.O., and Mrs. Gibson, of The Croft, Oxted, Surrey. Educated at St. Christopher's, Eastbourne, and Wellington College (Hardinge Dormitory), he joined the R.F.C. on leaving school, was gazetted on August 1st, and went to the front on August 22nd. His eldest brother, Lieutenant Malcolm Reginald Gibson, East Surrey Regiment, was killed on October 8th, 1915.

Captain A. B. JARVIS, Middlesex Regiment and R.F.C. aged 24, killed in action on August 10th, was the fourth son of the late E. F. and Mrs. Jarvis, of Albert House, Cromer.

Flight Sub-Lieutenant E. H. KENDALL, R.N., reported as "presumed killed," was the younger son of Mr. and Mrs. E. C. Kendall, of Heswall, Cheshire. He was educated at Mr. Foster's, Stubbington, and Shrewsbury School, where he won the school quarter-mile swimming race. He went to

Salonica with the 2nd Duke of Cornwall's Light Infantry as lieutenant, was invalided home, and then joined the R.N.A.S., and had only been eight days at the front when, flying at a height of 13,000 ft., he was attacked by an enemy machine, had his petrol tank fired, and was killed.

Second Lieutenant GEORGE HAROLD KNIGHT, R.F.C., aged 25, killed in action on October 6th, was the second son of the late Mr. George Knight and Mrs. Knight, of "Ashstead," Clevedon, formerly of Clifton, Bristol.

Captain ALWYNE TRAVERS LOYD, The Buffs, R.F.C. (Flight Lieutenant), killed in action on September 28th, was the third son of Mr. and Mrs. Llewellyn Loyd, of Lillesden, Hawhurst, Kent. He was aged 23 years.

Second Lieutenant CHARLES ANGELO MOODY, R.F.C.s previously reported missing, is now reported by the German, to have been killed in air fighting on August 31st last. The son of the Rev. H. Moody, vicar of Welshampton, Ellesmere, he was educated at King William's College, Castletown, Isle of Man, where he was in the football fifteen in 1915-16 and the cricket eleven in 1916. A lance-corporal in the O.T.C., he joined the R.F.C. in December, 1916, and went to the front last July. His twin brother is also in the R.F.C.

Second Lieutenant CHRISTOPHER FRANK KIRSHAW PIERSON, R.F.C., killed on October 10th, was the youngest son of the Rev. Kirshaw T. Pierson and Mrs. Pierson, of The Grampians, Hastings. Born in 1899, he was educated at St. George's, Windsor, and at Christ's Hospital, Horsham. He was trained in the Cadet Corps at Jesus College, Oxford, and was gazetted last April, and at once proceeded to the front.

Lieutenant ERIC RUSSELL, M.C., R.F.C., who has died of wounds, on October 7th, was youngest son of the late C. H. Wilkinson and Mrs. Wilkinson, of 55, St. Mary's Mansions, W.2.

Second Lieutenant A. A. STEWARD, R.F.A., attached R.F.C., who was killed on October 6th, was the younger son of Canon Steward, of Boyton Rectory, Codford, Wilts, and of the late Mrs. Steward. He was educated at Wellington and Magdalen College, Oxford. He held a commission in the Norfolk Militia during the South African War, in which he saw active service. He was subsequently ordained by the Archbishop of York to a curacy in Hull, and at the outbreak of the war was on the staff of St. Mary's, Johannesburg. He returned to England, offered his services as a combatant officer, and was given a commission in 1915 in the R.F.A., proceeding to the front in April, 1916. He was transferred recently to the R.F.C. as an observation officer. He married in 1912 Miriam, third daughter of the late S. H. Carver, of Alexandria, and of Mrs. Carver, The Moat, Downton, and leaves three daughters.

Lieutenant JACK TOBIN-WILLIS, R.F.C., killed on August 17th, aged 21, was the only son of Dr. and Mrs. Willis, and nephew of Dr. Tobin, of Ilkeston, Derbyshire, and grandson of the late James Tobin, of Tincurry House, Cahir, Co. Tipperary. He was educated at St. Cuthbert's, Newcastle-on-Tyne, and afterwards by the Benedictines at Douai Abbey. He was a law student and an undergraduate of London University. Having got his commission in the A.S.C. (Cavalry) he went to France in January, 1915, and was posted to the 1st Cavalry Division, serving as supply officer, claims officer, and adjutant. About six months ago he volunteered for the Royal Flying Corps, and came to Brooklands for his training as gunner and observer, which he soon completed, and returned to the front. Later he won his "wings," and it is recorded that he and his pilot, Lieutenant Sayers, accounted for two German aeroplanes on August 14th.

Lieutenant MAURICE HERBERT WOOD, Lincoln Regiment, attached R.F.C., reported missing on April 13th last, is now known to have been killed four miles over the enemy lines on that day. He was the fourth son of Mr. and Mrs. A. W. Wood, of Eversley, Grove Hill, Woodford, Essex, and was educated at Bancroft's School and University College, London, taking his B.A. degree with honours in history, and French. At University College he belonged to the O.T.C., and he was on the staff of the Grammar School, Stamford, Lincolnshire. He received his commission before the outbreak of war and went to the front in February, 1915, as bombing officer to his battalion. Later he was appointed second in command of a grenade school, and was mentioned in dispatches. He came home July, 1916, to join the R.F.C. and returned to the front early in the year. He was married last February to

Hilda, elder daughter of the late T.O. Newman and Mrs. Newman, The Hollies, Stanstead, Essex.

Second Lieutenant CECIL R. BASCOMBE, R.F.C., aged 19, killed whilst flying on October 10th in Lincolnshire, was the only son of Mr. and Mrs. Reginald Bascombe, of Alvington House, Bury St. Edmunds, aged 19 years.

Captain CECIL S. J. GRIFFIN, Gordon Highlanders, attached R.F.C., who died in Croydon War Hospital on October 11th as the result of an accident while flying, was the only son of Lieutenant-Colonel C. P. G. Griffin (now attached to the Suffolk Yeomanry) and Mrs. Griffin, of Berridon Hall, Bradworthy, Devon, and was 22 years of age. He was educated at Tonbridge, and married the only daughter of the late Mr. S. Oxenham. He was gazetted to the Gordon Highlanders in May, 1914, and served with the regiment on the Aisne, Marne, and before Ypres, being wounded in September, 1914. He joined the R.F.C. early last year and saw service at the front.

Second Lieutenant DENIS JOHN HERIOT MAYNE, Royal Irish Rifles, attached R.F.C., who was accidentally killed while flying in Middlesex on October 11th, aged 18, was the eldest son of the Rev. J. St. C. Mayne and Mrs. Mayne of 29 Cavendish Road West, N.W. He was educated at Hillbrow, Eastbourne, and at Wellington College, and passed thence into Sandhurst in August, 1916. He joined the Royal Irish Rifles and was attached to the R.F.C. last April. While training he met with an accident in August, and after six weeks in hospital and on sick leave he returned to duty.

Second Lieutenant WILLIAM QUINTUS NEWSUM RICHARDSON, R.F.C., who was killed on October 6th while flying in Essex was the eldest son of the late W. S. Richardson of Lindum House, Lincoln and Mrs. Richardson, of Bradfield, Berks. He was aged 19.

Married.

On September 26th, at Houghton Church, Stockbridge, Major RODERIC M. HILL, M.C., R.F.C., was married to HELEN, elder daughter of Lieut.-Colonel E. R. MORTON.

Lieutenant JACK E. ADDINSELL, Royal Munster Fusiliers and R.F.C., third son of Mr. and Mrs. W. Arthur Addinsell, of Harrow Weald Lodge, Middlesex, was married on October 13th at St. Paul's, Knightsbridge, to MURIEL, second daughter of Mr. and Mrs. R. J. BLACK, of 29, Wellington Court, S.W., and The Knipp, Chiddingfold, Surrey.

Lieutenant S. G. ROME, M.C., Argyll and Sutherland Highlanders and R.F.C., younger son of Colonel and Mrs. Rome, Knockbay, Campeltown, Argyllshire, was on October 17th at St. Giles's Cathedral, Edinburgh, married to DOROTHY JALLAND, only daughter of Lieut.-Colonel Harold J. STILES, M.B., F.R.C.S.Ed., R.A.M.C. (Temp.), and Mrs. Stiles, 9, Great Stuart Street, Edinburgh, and Whaddon Lodge, Gullane.

To be Married.

The engagement is announced between HUGH GEORGE CORBY, Captain, Royal Munster Fusiliers, attached R.F.C., and BERYL KATHLEEN, only daughter of Mr. and Mrs. Jack KNECHTEL, of 52, Carson Road, West Dulwich.

An engagement is announced between Mr. R. C. FARROW, C.F.A., attached R.F.C., and Miss MARY HAY MURRAY, youngest daughter of the late Evelyn Hay Murray, of Hascombe, Goldalming.

The marriage of Captain ROY IRONS, R.F.C., and the Hon. WINIFRED SMITH will take place quietly at St. Peter's, Eaton Square, on October 24th, at 2.15.

The engagement is announced of Lieutenant ROGER RILEY, Warwickshire Yeomanry, attached R.F.C., eldest son of the Rev. E. and Mrs. Riley, of Leek Wootton, Warwick, and ELEANOR DOROTHEA COWLARD, second daughter of the late Rev. W. Cowlard and the late Mrs. Cowlard, of Bovey Tracey, Devonshire.

A marriage has been arranged, and will take place on November 10th in London, between HAROLD SHERWOOD SPENCER, Captain, Royal Irish Fusiliers, attached R.F.C., and ELLA SHEARER, eldest daughter of Mr. and Mrs. James BEATTIE, of Canmore, St. Andrews, and 4, Buckingham Street, Buckingham Gate, London, S.W.

A marriage has been arranged, and will shortly take place, between Captain HERBERT SANFORD WARD, R.F.C., elder son of Herbert Ward, of 105, Avenue de Malakoff, Paris, and JOYCE, younger daughter of Sir Charles Norris NICHOLSON, Bt., M.P., of 35, Harrington Gardens, S.W.

The marriage will take place, at Elm Road Church, on October 27th, at 9 a.m., between Lieutenant T. KENNETH YOUNG, R.N.V.R., attached to R.N.A.S., elder son of Mr. and Mrs. Thomas F. Young, Ingress, Furze Lane, Purley, and HELEN DOROTHY, youngest daughter of Mr. and Mrs. GROSE, Tintagel, Beckenham.



The American Ambassador on the U.S. Effort.

OPENING an extension of the Second Northern General Orthopaedic Hospital, at Leeds, on October 10th, Mr. Page, the American Ambassador, in the course of an address, referred to America's preparation for the war in the air. He said the aeroplane was an American invention in which they took a practical and a sentimental interest. There were 20,000 air machines now under contract for the American Army, and 24 great air camps had been formed, where 100,000 flying men were in training. The plans for an unprecedented sky fleet were to be carried out with the greatest speed. Add these machines to the greatly increased British production of aeroplanes, and they would see such a flying army as no man could have foreseen even half a year ago. Flying enthusiasts told them the war would be won in the air. Well, there was no doubt then who would win it. He thought it would be won quickly after the augmented squadrons of Britain and America began their work.

The U.S. Liberty Engine.

WITH reference to an Airism in last week's issue, regarding the hustling way in which the United States aviation engine—designated by the Signal Service, the Liberty engine—was produced, some further particulars are now available. According to Mr. Baker, the United States Secretary for War, the engine has passed its final tests successfully, and in power, speed, serviceability, and minimum weight, it invites comparison with the best the European has produced.

The engine was brought about through the co-operation of more than a score of engineers, who pooled their skill and trade secrets in the war emergency, working with the encouragement of the Aircraft Production Board, the War Department, and the Bureau of Standards. The new engine amounts practically to an international model. It embodies the best there is in American engineering, and the best features of European models, so far as it has been possible to adapt the latter to American manufacturing methods.

The two engineers most directly connected with the production of the United States Aviation engine had before them not only the blue prints and models of the most successful engines the war has produced, but also every available American suggestion. They also had the assistance of the British, French, and Italian representatives in the States. Cylinders, pistons, and every other part of the motor have been standardised, and it is possible to build the engines in four models, ranging from four to 12 cylinders.

The standardisation of the new engine does not mean there will be no change in it during the war. There will be continuous experimentation, as new types and improvements develop at the front, and new ideas are born of the war emergency. If the engine can be improved, it will be improved; but both the flying and the altitude tests of the new motor have been gratifying. One test was conducted at Pikes Peak, where the United States aviation engine performed satisfactorily at this high altitude. One engine in an aeroplane broke the American altitude record in a recent flying test.

Italy's Leading Pilots.

LIEUT. OLIVARI, who was killed in a mishap to his machine on October 13th, was credited with shooting down the first Austrian aeroplane at the outbreak of war. He had brought down 12 machines, Mr. J. M. J. Jeffries, writing to the *Daily Mail* says: "Lieut. Olivari had been talking and laughing with friends just before starting on his last flight, when he suddenly broke off the conversation, became serious, said some words upon the death of Guynemer, got into his machine, and had barely risen 260 ft. when suddenly his aeroplane fell straight to the ground and was wrecked."

CAPT. BARACCA, who has brought down 19 aeroplanes, heads the list of successful Italian pilots; Sub-Lieut. Barachini, Lieut. Ruffio di Calabria, and Major Piccio, have each brought down 13.

MAGNETO IGNITION.

IV.—SLEEVE INDUCTOR AND POLAR INDUCTOR MAGNETOS.

So far, in describing the working of high tension magnetos, reference has been confined to the class of machine in which the armature, carrying the two coils rotates between the pole-pieces. There are, however, two other types of high-tension magneto-electric machines, which, although they are not so extensively used, are now receiving a good deal of attention. They are known as the sleeve inductor and the polar inductor types.

In its general design, and arrangement the sleeve inductor magneto is very like the rotating armature type. Its characteristic feature, however, is that the armature is fixed in a vertical position, while between the armature and the pole-pieces revolves a slotted sleeve of soft iron. The result is that with a magneto of this type four sparks are obtained

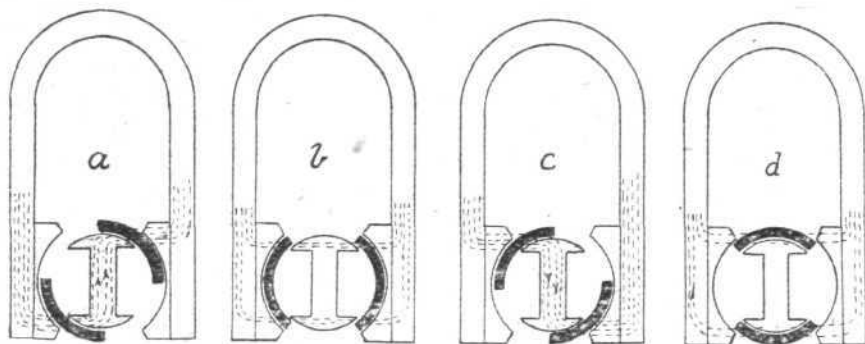


Fig. 16.—Sketches showing four successive positions of the sleeve in a sleeve inductor magneto.

during each revolution as compared with the two given by the revolving armature machine. To understand why this is so, reference must be made to Fig. 16, where the thick black line represents the metal of the sleeve. Here it will be seen that at (a) the magnetic lines are going through the coils, the sleeve serving to bridge the gap between one edge of the armature on each side and the pole-pieces. When however the sleeve has rotated a little further to (b) it enables the magnetic lines to pass from pole to pole without going through the coil. A little further rotation, to (c), and the lines are once more flowing through the coil, but in the reverse direction; this continues until (d) is reached, when the magnetic lines are again cut. As the sleeve from position (b) to position (d) has only completed one-quarter of a revolution, it follows that four times during each revolution the direction of the magnetic flux through the armature is reversed and so four sparks can be obtained. Against this advantage, however, has to be set disadvantages from the manufacturing point of view, the design being complicated and necessitating the employment of a great deal of skilled labour.

As pointed out by A. P. Young in his lecture on the "High Tension Magneto," before the Aeronautical Society, the polar inductor type of magneto is of much simpler construction than the sleeve inductor type. There are several features in the design which combine to greatly simplify the manufacturing problems, and although little has been heard of the system up to the present, it is not unlikely that it may become the dominant type.

As was pointed out by Mr. Young in his lecture, the basic principle of the polar inductor type of magneto is a British invention, which we owe to Mr. T. Blackwood Murray, who patented it in 1906. It not being possible, for obvious reasons, to describe the latest developments in this direction, the principle upon which this type of machine works, may be described with reference to the Murray machine.

In the diagrammatic sketches, Fig. 17, the armature is

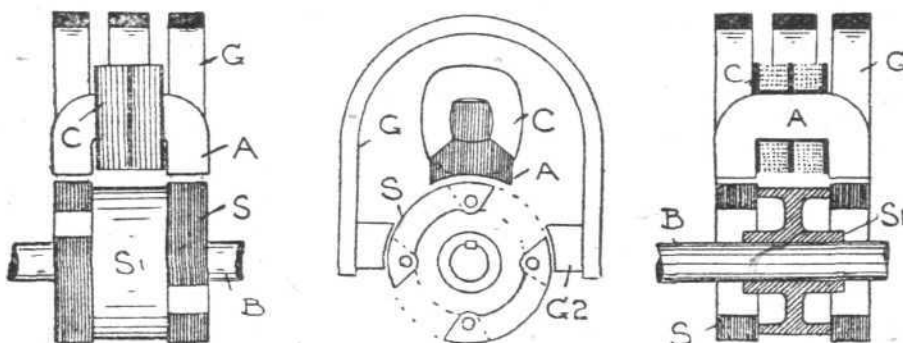


Fig. 17.—Diagrammatic sketches showing the general arrangement of the Murray polar inductor magneto.

shown in the curved portion of the magnets. It consists of a laminated soft-iron core (A), built up of thin insulated plates stamped to a special shape. Wound about the centre of the core is the coil (C), in which the current of electricity is generated by the changing magnetic state of the core when the machine is at work.

Occupying much the same position as the armature in ordinary magnetos is the "rotor" consisting of an aluminium spider (S₁), carrying a set of four inductors (S). These inductors, two of which are arranged at each end of the spider, consists of laminated iron segments, and are so placed that those at one end lie opposite to the gaps between those at the other end.

With the rotor lying in the position shown in the centre illustration of Fig. 17, therefore, it is possible to trace out an almost unbroken iron path between the magnet poles. Leaving the north pole the magnetism passes through one of the inductor segments to the armature core (A), leaving which it enters an inductor-segment at the far end of the rotor and so completes its magnetic circuit to the south pole. Turning the rotor a quarter revolution in either direction brings the inductors into a corresponding position relative to the armature-core, but the magnetic flux travels in the reverse sense, for it is the segment at the far end of the armature which is then adjacent to the north pole (assuming the north pole to be on the left), and the magnetism in this instance must, therefore, travel across the south pole by means of the segment on the front end of the rotor. Between

these two opposite magnetic conditions there must be an intermediate position of the rotor in which the armature core is virtually devoid of magnetic lines of force, since such a state is essential before the direction of the magnetic flux can be reversed. Theoretically, this position occurs when the rotor has turned one-eighth of a revolution from the position illustrated in Fig. 17, but in practice it may be a few degrees later than this owing to the reluctance of the magnetism to change its direction until absolutely compelled to do so.

As the inductors are relatively narrow, in order to avoid leakage, and to concentrate the lines of force, the pole-pieces are cut away in the centre, where they are not opposite the

inductors, so that each of them virtually consists of two pole pieces connected together.

From the above particulars the method of obtaining the necessary reversals of the magnetic flux in the armature should be clear, but, of course, there are several ways in which the principle may be employed. The difference between the new types of polar inductor magnetos and the Murray machine, mainly consist in the arrangement of the inductors for the passing of the magnetic flux from the magnets to the armature and back to the magnets again.

Reward for d'Annunzio.

GABRIELE D'ANNUNZIO, the Italian poet, has received his fourth medal for bravery in recognition of his splendid services during the air raid on Cattaro.

Fate of Ludendorff's Stepson.

THE *Telegraaf* reports that the body of a German aviator which was washed up some time ago on the shore north of

Beveland, has proved to be that of General Ludendorff's stepson, Franz Pernet. It has been exhumed for transport to Germany.

New Zeppelins.

For some time little has been heard of new Zeppelins but the latest story from Zurich is that an improved type of Zeppelin is being turned out at Friedrichshafen at the rate of one every ten days.

The British Air Services

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

Admiralty, October 9th.

Probationary Flight Officer (Temp.).—R. B. Hunter, entered as Prob. Officer (Temp.), with original seniority of June 24th.

Petty Officer.—C. F. Mossman, entered as Prob. Flight Officer (Temp.), seniority Sept. 30th.

3rd Writer.—A. Copley, entered as Prob. Flight Officer (Temp.), seniority Oct. 6th.

Ordinary Seaman.—C. F. Walker, entered as Prob. Flight Officer (Temp.), seniority Oct. 14th.

Acting Quartermaster-Serjeant.—G. T. Scott, entered as Prob. Flight Officer (Temp.), seniority Sept. 25th.

G. L. H. Byrne, E. S. Chantrell and G. S. Ranshaw all entered as Prob. Flight Officers (Temp.), seniority October 8th.

Wt. Teleg. (R.N.R.).—H. J. Gallagher, granted temp. commission as Sub-Lieut. (R.N.V.R.), seniority Oct. 6th.

Admiralty, October 12th.

Flight Sub-Lieuts.—H. Cartside-Tipping and E. L. D. Bartley, both promoted to rank of Flight Lieut., seniority Sept. 15th.

Lieut., Temp. (R.N.V.R.).—W. L. Marsh, promoted to Lieut.-Comdr., Temp. (R.N.V.R.), seniority Oct. 10th.

Prob. Sqn. Comdr.—A. Leamon-Berry, confirmed in rank of Sqn. Comdr., seniority Sept. 21st.

Prob. Flight Lieut., Temp.—G. D. Nelson confirmed in rank of Flight Lieut. (Temp.), seniority Sept. 21st.

Late Lieut., Temp. (R.N.V.R.).—C. W. Small, granted temp. commission as Lieut. (R.N.V.R.), seniority Oct. 11th.

Leading Mechanic.—A. C. Tanser, granted temp. commission as Sub-Lieut. (R.N.V.R.), seniority Oct. 11th.

G. Davis and G. W. G. J. Dunn entered as Prob. Flight Officers (Temp.), seniority Sept. 28th.

S. J. Hern granted temp. commission as Lieut. (R.N.V.R.), seniority Oct. 8th.

F. G. Tryhorn granted temp. commission as Sub-Lieut. (R.N.V.R.), seniority Oct. 11th.

Admiralty, October 13th.

The following have been entered as Prob. Flight Officers (Temp.), seniority as stated:—H. W. Riding and P. H. Rochard, both Sept. 24th; V. T. Lloyd-Davies, Sept. 30th; F. C. David, Oct. 1st; V. A. Bishop, Oct. 2nd; C. A. Dell, H. A. A. Brosse, J. Altham, F. M. Anderson, B. M. Bell, A. Boyd, C. C. Butler, A. J. E. Chaplin, M. M. Cuthbert, E. H. du Heaume, G. M. Ferguson, I. H. Grabowsky, A. E. Gullett, M. G. Hallows, R. H. Haworth-Booth, B. Hearne, W. F. Jones, S. King, R. M. Lamb, E. W. R. Matthews, E. S. Morgan, L. N. Morrison, E. Munro, A. E. Murrell, C. C. G. Nickels, A. D. Pate, R. A. Pettif, H. Saunders, D. E. Spalton, J. H. Sprackling, E. Squire, M. F. Thwaite, F. C. Vincent, A. Welle, and L. A. Westcott, all Oct. 7th; C. E. V. Taylor, Oct. 13th; G. W. R. Beach, H. C. Brown, D. C. Burgess, S. D. Bussey, S. D. Dennis, and F. R. Watkins, all Oct. 15th.

F. M. Hanna, entered as Lieut. (Temp.), R.N.V.R., seniority Oct. 13th.

Royal Flying Corps (Military Wing).

London Gazette Supplement, October 9th.

The following to be 2nd Lieuts. for service in the Field, R.F.C.—Actg. Serjt. Major A. M. Cawthra; Sept. 14th.

The following appointments are made:—

Wing Commander.—Major R. G. Cherry, M.C., R.A., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Aug. 28th.

Squadron Commanders.—From Flight Comdrs., and to be Temp. Majors whilst so employed; Sept. 21st.—Lieut. (Temp. Capt.) K. D. P. Murray, S.R.; Lieut. (Temp. Capt.) T. Maxwell-Scott, M.C., S.R.

Flying Officers.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—W. O. Stoddart; Sept. 5th. C. C. Kilner, J. D. Smith; Sept. 9th. Temp. 2nd Lieut. (on prob.) H. B. Davis, S.R.; Sept. 12th. Temp. 2nd Lieut. (on prob.), Gen. List, and to be confirmed in their rank: J. F. T. Barrett, J. H. Keeble, L. L. Grant; Sept. 15th. Lieut. W. A. Sewell, Bord. R. (T.F.); Sept. 19th. From Flying Officers (Ob.): Lieut. G. G. Coury, V.C., S. Lan. R., S.R., seniority Aug. 28th, 1916; Temp. 2nd Lieut. L. G. Banks, Gen. List, seniority Oct. 26th, 1916; Sept. 20th. Lieut. W. O. Boger, Can. Cav., seniority Sept. 18th, 1916. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: W. C. Dennett, F. A. Hewens; Sept. 21st.

Flying Officers (Observers).—Temp. 2nd Lieut. W. Adamson, R.A., seniority June 18th, and to be transf'd. to R.F.C. Gen. List; Lieut. W. E. Dexter, Can. Gen. List, seniority July 4th; Lieut. W. H. Kilby, Can. Inf., seniority July 18th; Lieut. R. Barnes, R.F.A. (T.F.), seniority July 23rd, and to be sec'd.; Sept. 20th. Lieut. A. Sattin, Can. Gen. List, seniority Aug. 4th; Temp. 2nd Lieut. A. E. Watkinson, attd. E. York R., seniority Aug. 21st, and to be transf'd. to R.F.C. Gen. List; Sept. 18th.

Assistant Instructors in Gunnery (graded as Equipment Officers, 2nd Class).—From Assistant Instructors in Gunnery (graded as Equipment Officers, 3rd Cl.).—Temp. Lieut. G. L. Chater, Norf. R.; Temp. 2nd-Lieut. G. M. Johnstone, Gen. List, and to be Temp. Lieut. whilst so employed; Sept. 22nd. (Graded as an Equipment Officer, 3rd Class).—Lieut. F. D. Sutherland, Can. M.G. Corps; Sept. 22nd.

Balloon Officer.—Temp. 2nd Lieut. (on prob.) G. G. L. Blake, Gen. List, and to be confirmed in his rank; July 17th.

Adjutant.—Lieut. F. A. Stappole, E. York. R., S.R., and to be Temp. Capt. (without the pay or allowances of that rank) whilst so employed; Sept. 17th.

Special Appointment (graded as a Park Commander).—Temp. Major E. A. Goodwin, Gen. List, from a Park Commander; Sept. 22nd.

Equipment Officers, 2nd Class.—From the 3rd Cl.—2nd Lieut. (Temp. Lieut.) C. A. Hudson, R.F.C. (T.F.), and to be Temp. Capt. whilst specially employed; Aug. 8th. Temp. 2nd Lieut. R. Wilson, Gen. List, and to be Temp. Lieut. whilst so employed; Sept. 12th.

3rd Class.—Lieut. F. N. Trinder, N. Staff. R., (T.F.) from Capt., attd. Rif. Brig., and to be sec'd. Aug. 1st. Capt. P. C. Franklin, A.S.C. (T.F.); Aug. 28th.

General List.—2nd Lieut. (Temp. Lieut.) A. Hingston, S.R., an Equipment Officer, 2nd Cl., and to be Temp. Capt. (without the pay or allowances of that rank) whilst specially employed; June 27th. Temp. 2nd Lieut. J. O. Dack resigns his commission; Oct. 10th. L. G. Morris (late Flight Officer, R.N.A.S.) to be Temp. 2nd Lieut. (on prob.); Sept. 21st.

Supplementary to Regular Corps.—2nd Lieut. F. Ryder resigns his commission; Oct. 10th.

General List (R.F.C.). Cadets to be Temporary 2nd Lieutenants (on probation).—F. Harrison; Sept. 9th. R. F. Bruce, W. Dowling, C. W.

Dunford, R. J. Findlay, F. D. C. Gaiger, J. F. Gibson, P. Hardy, E. G. Henderson, E. W. Keep, J. Macnaught, A. O. Matt, L. L. Medlen, W. N. Mitchell, R. T. North, A. W. Palmer, R. L. Philip, T. H. Spence, D. A. S. Stephens, L. C. S. Tatham, T. Taylor, J. F. Titmas, S. G. Waine, R. Wallace, R. D. Warren, C. S. White, J. Whittaker, H. Wisnekonitz, F. M. Woolner, C. Wright, H. C. Adams, A. L. Aldridge, T. Allan, C. E. H. Allen, F. Atkinson, H. L. Barradell, J. G. Beck, F. A. Benitz, F. W. Birkinshaw, W. F. Blanchfield, A. J. Bonella, C. Brooks, E. Cardinal, F. Carpenter, F. D. B. Cattell, W. I. Caven, R. Chalmers, H. P. Chubb, R. Collopy, A. F. Corker, R. Craik, R. T. Cuffe, W. S. Dailey, F. Denham, L. Dickinson, N. C. Dixie, F. Dixon, J. G. Dunlop, J. B. Elliott, S. R. Elworthy, F. B. Evans, J. R. Field, A. E. Fitness, C. H. Flere, D. J. Fryer, J. S. W. Gair, L. M. Gerson, W. F. Gonzalez, L. M. Goodfellow, J. W. Gray, A. D. Gudger, G. N. Hardwick, W. N. Hemming, J. Heys, G. R. Hill, C. R. Hoare, A. B. Holden, W. E. Holland, G. A. Hood, C. N. Hosken, A. Hutcheson, R. V. Jameson, B. Johnson, G. H. Johnston, E. D. Jones, C. G. Joyce, L. H. Kearne, A. W. Kelly, J. G. Kerr, J. Keyte, C. O. D. Kidd, T. Killeen, W. D. Knibbs, T. J. Lamb, T. M. G. Lamb, S. G. Lane, S. G. Larrard, H. C. Lewis, L. T. Lewis, A. A. MacArthur, D. A. MacCartney, E. N. MacDonald, D. M. McGregor, G. K. MacGregor, G. McHardy, I. C. R. Mackenzie, J. M. McLintock, G. O. Manton, N. Midgley, J. Mill, C. Miller, J. G. Murray, F. A. S. Nesbitt, H. J. Nicol, R. F. Overbury, J. W. Page, C. R. Pithey, A. Platt, S. R. L. Poole, F. Pooley, A. A. Powell, C. L. Price, K. A. Ranney, J. E. Ransome, S. Rendle, E. C. Robinson, A. A. Ross, H. Roughton, F. A. Rowe, C. P. Rumball, A. Sevastopulo, W. H. Scott, T. S. Seymour, L. F. Sewell, F. V. Sheard, R. Sherwood, F. D. Shreeve, C. M. Shilcock, E. Sidey, H. C. Smith, J. H. Smith, A. L. Stirk, G. R. Stafford, B. W. N. Still, J. Stott, M. F. Sutton, K. W. Switzer, J. A. Sykes, H. J. Tinker, G. Travers, E. R. Trendell, R. R. Truscott, P. M. Tudhope, O. McI. Turnbull, E. N. Underwood, J. R. Watkins, A. Webster, G. L. Webster, P. C. Westophen, F. W. White, R. B. Whittick, S. S. Woodman, G. N. Wilton, P. C. West; Sept. 13th.

London Gazette Supplement, October 10th.

The following temporary appointment is made at the War Office:—**Deputy Assistant Director.**—Capt. (Temp. Major) S. A. Currin, R.F.C., S.R., from a Special Appointment (graded as a Park Comdr.), and to relinquish his temp. rank; July 10th.

The following appointments are made:—

Flight Commanders.—From Flying Officers.—Capt. W. S. Scott, M.C. Lan. Fus. (T.F.); Sept. 7th. And to be Temp. Cpts. whilst so employed: Temp. 2nd Lieut. (Temp. Lieut.) G. R. A. Deacon, Gen. List; 2nd Lieut. A. G. V. Taylor, Ind. Inf.; Sept. 26th.

Flying Officers.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: B. F. Braithwaite; Sept. 7th. J. Cushay; Sept. 16th. 2nd Lieut. H. J. Hunter, Sea. Highrs. (T.F.), and to be sec'd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—H. G. Jackson, L. H. Cryer, J. S. Macaulay; Sept. 17th. P. A. Baker; Sept. 18th. C. Addenbrooke, T. E. A. Griffith, R. M. Tate; Sept. 19th. R. B. Esdaile; Sept. 20th. Lieut. W. E. Harmon, M.C., Canadian Gen. List; Sept. 21st.

Flying Officers (Observers).—Lieut. R. J. Morton, Midd'x R. (T.F.) (June 30th, seniority from March 31st), and to be sec'd.; Temp. 2nd Lieut. J. Kirk, R. Highrs. (June 25th, seniority April 20th); Temp. 2nd Lieut. A. S. Clark, Cam'n Highrs. (Aug. 24th, seniority May 6th); 2nd Lieut. L. W. Harman, R.F.A. (T.F.) (Aug. 16th, seniority May 14th) and to be sec'd.; Temp. 2nd Lieut. J. H. Maingot, B.W. Indies R., seniority July 2nd; 2nd Lieut. A. C. Roxburg, Yeo. (T.F.), seniority July 13th, and to be sec'd. (Aug. 31st). Temp. 2nd Lieut. A. Hopkins, B.W. Indies R. (July 31st, seniority July 17th).

Park Commanders.—Temp. Qrmr. and Hon. Lieut. (Temp. Capt.) S. C. Parr, R.F.C., from an Equipment Officer, 1st Cl., and to be Temp. Major whilst so employed; Sept. 1st.

Equipment Officers, 1st Class.—Capt. Sir J. W. B. Simeon, Bt., Hamps. R. (T.F.), from an Equipment Officer, 3rd Cl.; Sept. 1st. 2nd Lieut. (Temp. Lieut.) O. Lindquist, S.R., from an Equipment Officer, 2nd Cl., and to be Temp. Capt. whilst so employed; Oct. 2nd.

Schools of Military Aeronautics.

Instructors (graded as Equipment Officers, 1st Class).—Lieut. (Temp. Capt.) G. I. N. Deane, R.E. (T.F.), an Equipment Officer, 1st Cl.; Temp. Lieut. A. Latimer, Gen. List, an Equipment Officer, 2nd Cl., and to be Temp. Capt. whilst so employed; Aug. 17th.

Assistant Instructors (graded as Equipment Officers, 2nd Class, and to be Temp. Lieuts. whilst so employed).—2nd Lieut. A. Hawley, Gen. List, an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. L. H. Straker, Gen. List, an Equipment Officer, 3rd Cl.; Aug. 17th.

Supplementary to Regular Corps.—2nd Lieut. G. D. Heathorn resigns his commission; Oct. 11th. 2nd Lieuts. (on prob.) confirmed in their rank: S. J. Brewer, C. H. Newbold, H. B. Davis.

General List (R.F.C., Military Wing).—Temp. 2nd Lieut. R. W. T. Bodilly resigns his commission owing to physical unsuitability for retention in the Corps; Oct. 11th.

London Gazette Supplement, October 11th.

General Staff.

General Staff Officers, 3rd Grade.—Lieut. (Temp. Capt.) C. E. Wardle, R.F.C., S.R., from a Flight Comdr., and to retain his temp. rank whilst so employed; Aug. 5th.

The following appointments are made:—

Flight Commanders.—From Flying Officers, and to be Temp. Cpts. whilst so employed: Lieut. J. L. Williams, S.R.; Temp. Lieut. F. B. Sedgwick, Gen. List; Sept. 1st.

Flying Officers.—2nd Lieut. (on prob.) V. C. Chapman, S.R.; June 5th. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: R. McC. Briggs, J. O. Moss, M. Newcomb; Sept. 8th. J. H. Sanders, R. V. Facey, H. B. Richardson, C. B. H. Lefroy; Sept. 17th. J. J. Quinn, M. C. P. Tuckett, M. G. W. Stewart, D. H. Chamberlain; Sept. 18th. E. C. Bateman, C. H. Crosbee, J. H. Page; Sept. 19th. Temp. Lieut. D. L. H. Moore, A.S.C., and to be transf'd. to R.F.C., Gen. List; Lieut. A. R. Tipton, R.G.A. (T.F.), and to be sec'd.; Lieut. S. B. Plummer, Canadian Gen. List; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: H. I. Pole, J. V. Turner; Sept. 20th. Temp. 2nd Lieut. N. K. Johnson, Gen. List, from an Equipment Officer, 3rd Cl.; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: B. R. H. Carter, W. M. Chowne; Temp. Lieut. J. L. Henry, Midd'x R.; 2nd Lieut. (on prob.) J. R. Moore, S.R.; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: H. T. Fattorini, W. C. Pruden, H. J. E. Stokes, W. E. Staton, S. L. Ward, G. A. Harrison, K. V. King, G. Rainbow, C. K. Wilson, J. P. Cavers; Sept. 21st. 2nd Lieut. G. C.

Stemp, E. Kent R., and to be sec'd.; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: A. C. Townsend, A. C. G. Brown, H. E. W. Bryning, A. W. Chadwick, J. P. Findlay; Sept. 22nd. 2nd Lieut. W. R. Bucknall, R. Highrs., and to be sec'd.; Sept. 23rd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: S. G. Spiro, H. C. E. Daggett; Lieut. R. Mayberry, R. Sc. Fus., S.R., from a Flying Officer (Ob.); Sept. 24th, with seniority from Nov. 5th, 1916.

Flying Officers (Observers).—Lieut. F. C. Higgins, Canadian Art. (Sept. 20th, with seniority from June 18th); 2nd Lieut. R. A. Nunn, Midd'x R. (T.F.), with seniority July 17th, and to be sec'd.; 2nd Lieut. L. E. Shaw, E. Kent R. (T.F.), seniority July 22nd; 2nd Lieut. C. L. Willcock, Linc. R. (T.F.), seniority July 25th, and to be sec'd.; Sept. 22nd. Temp. Lieut. C. H. Dixon, A.S.C., seniority July 30th, and to be transfd. to R.F.C., Gen. List; Lieut. G. D. Gillie, M.C., Canadian Inf., seniority July 30th; 2nd Lieut. J. P. F. Adams, Durh. L.I., S.R., seniority Aug. 5th, and to be sec'd.; Temp. Capt. S. H. Holland, attd. R.W. Surr. R., seniority Aug. 6th, and to be transfd. to R.F.C., Gen. List; Sept. 24th.

Adjutant.—Lieut. N. A. Daniell, C. Gds., to be Temp. Capt. (without the pay or allowances of that rank) whilst so employed, and to be sec'd.; Sept. 18th.

Equipment Officers, 2nd Class, from the 3rd Class.—Lieut. T. A. B. Rolfe, S.R.; Temp. Lieut. H. S. Hawkes, Gen. List; Sept. 1st.

3rd Class.—Temp. 2nd Lieut. (on prob.) C. G. Foster, Gen. List, and to be confirmed in his rank; Sept. 20th.

General List.—The undermentioned, from R.F.C., to be Temp. 2nd Lieuts. (on prob.).—3rd Cl. Air Mech. W. W. Winterbottom, 3rd Cl. Air Mech. A. G. Ridgion, 2nd Cl. Air Mech. L. Shears, 1st Cl. Air Mech. H. C. Duckworth, 1st Cl. Air Mech. M. G. Fountain, Sgt. H. W. Mason; Aug. 28th. 1st Cl. Air Mech. L. F. W. Stone, Actg. Corpl. R. W. Lane, 2nd Cl. Air Mech. F. H. Allbridge, 2nd Cl. Air Mech. H. E. H. Dering, Act. Sgt. W. B. Morison, 3rd Cl. Air Mech. C. E. Yates, Actg. Sgt. Major J. Bennett; September 1st. Temp. 2nd Lieut. F. S. Thomas to be Temp. Capt.; July 7th. Cds. to be Temp. 2nd Lieuts. (on prob.): E. J. W. Addington, L. Childs, A. F. Dawes, H. M. Donald, G. Ezard, L. V. Evans, H. R. Fuhr, J. Fraser, A. G. Finlayson, R. J. Gregory, G. P. Hoyle, G. Harrison, W. P. Johnson, A. V. Jones, F. N. Katzin, I. L. R. Large, M. S. Lewin, H. V. C. Luyt, J. J. Mackenzie, F. Moss, H. Oates, C. Oldfield, R. R. Orchard, S. C. M. Pontin, J. L. Probit, J. R. Piggott, E. G. Reynolds, J. E. Reid, C. W. Rourke, G. Saunders, H. A. Scrivener, B. Solomons, R. E. Taylor, G. D. Wigley, H. L. Whiteside; Oct. 7th.

London Gazette Supplement, October 12th.

Memorandum.—Major the Hon. C. M. P. Brabazon, I. Gds., to be Temp. Lieut.-Colonel whilst employed as a Wing Comdr., R.N.A.S.; June 30th.

Military Wing.—The following appointments are made:—

Flying Officers.—Temp. 2nd Lieut. G. H. Stocking, Ches. R., and to be transfd. to R.F.C. Gen. List; July 6th. Temp. 2nd Lieut. H. G. Freeman, Gen. List; July 18th. Temp. Capt. L. G. Loudoun, A.S.C., and to be transfd. to R.F.C. Gen. List; Aug. 5th. Lieut. D. H. Hazell, R. Lanc. R., and to be sec'd.; Aug. 6th. 2nd Lieut. E. E. Arnold, Lond. R. (T.F.), and to be sec'd.; Aug. 8th. Temp. Capt. A. S. Edwards, M.G. Corps, and to be transfd. to R.F.C. Gen. List; 2nd Lieut. (on prob.) J. Cowdan, S.R.; Aug. 10th. 2nd Lieut. N. L. Moon, Hrs. S.R.; Aug. 13th. Temp. Maj. M. R. McGregor Turnbull, A.S.C., and to be transfd. to R.F.C. Gen. List; Temp. 2nd Lieut. A. Dix-Lewis, Midd'x R.; 2nd Lieut. C. B. Godfrey, Lan. Fus., and to be sec'd.; 2nd Lieut. J. Boyd, High. L.I. (T.F.), and to be sec'd.; Aug. 14th. Temp. 2nd Lieut. B. F. Wates, A.S.C., and to be transfd. to R.F.C. Gen. List; Aug. 15th. Lieut. F. R. Offord, R. Muns. Fus., and to be sec'd.; Aug. 16th. Lieut. T. S. Ivens, Ches. R., from a Flying Officer (Obs.); Aug. 19th, seniority Sept. 22nd, 1916. Temp. 2nd Lieut. F. G. Tippinge, Gen. List, from a Flying Officer (Obs.); Sept. 14th, seniority April 11th, 1916. Temp. Lieut. H. W. Phear, Gen. List, from an Equipment Officer, 3rd Class; Sept. 22nd.

Assistant Instructors in Gunnery.—(Graded as Equipment Officers, 3rd Class). 2nd Lieut. F. A. Swoffer, Midd'x R. (T.F.), from a Flying Officer; Sept. 15th. 2nd Lieut. R. Backhouse, Yorks L.I. (T.F.), from Temp. Lieut., M.G. Corps; Lieut. I. H. H. Robinson, R.G.A. (T.F.), from a Flying Officer; Temp. 2nd Lieut. P. Brass, M.G. Corps, and to be transfd. to R.F.C. Gen. List; Temp. Lieut. D. G. Bourn, M.G. Corps, and to be transfd. to R.F.C. Gen. List; Temp. 2nd Lieut. (on prob.) E. W. Chatterley, Gen. List, and to be confirmed in his rank; Sept. 18th.

Balloon Officers.—Temp. 2nd Lieut. H. S. Starling, Gen. List; June 25th. Temp. 2nd Lieut. C. K. Medlen, R.A., and to be transfd. to R.F.C. Gen. List; Sept. 23rd.

Adjutant.—Capt. L. M. P. Sullivan, Lond. R. (T.F.); Sept. 4th. Lieut. (Temp. Capt.) T. M. Eggar, Lond. R. (T.F.) vice Temp. 2nd Lieut. A. E. Morgan, S. Wales Bord., who relinquishes actg. rank of Capt.; Sept. 6th.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. (on prob.) J. A. Donnelly, Gen. List, and to be confirmed in his rank; Sept. 19th. Capt. G. P. Burrell, M.C., Hamps. R. (T.F.), and to be sec'd.; Sept. 21st.

Schools of Instruction.—Schools of Military Aeronautics.

Assistant Commandant.—(Graded as a Sqdrn. Comdr.).—Capt. G. G. Adeley, R. Ir. Rif., a Flying Officer, and to be Temp. Maj. while so employed, vice Major P. E. L. Elgee, R. Berks R.; Sept. 18th.

Chief Instructor.—(Graded as a Sqdrn. Comdr.).—2nd Lieut. (Temp. Capt.) W. C. Campbell, D.S.O., M.C., S.R., from an Instr. (graded as a Flight Comdr.), School of Mil. Aeronautics, and to be Temp. Maj. while so employed, vice Lieut. (Temp. Maj.) G. S. M. Ashby, R.A.; Sept. 18th.

Instructor.—(Graded as a Flight Comdr.).—Capt. C. O. Fairbairn, N. Lan. R., S.R., a Flight Comdr., vice 2nd Lieut. (Temp. Maj.) W. C. Campbell, D.S.O., M.C., S.R.; Sept. 18th.

Assistant Instructor.—(Graded as an Equipment Officer, 2nd Class).—Temp. Lieut. J. F. Alcock, Gen. List, a Flying Officer; Sept. 20th.

School of Technical Training.

Assistant Instructor.—(Graded as an Equipment Officer, 2nd Class).—Temp. Lieut. J. Jensen, Gen. List, an Equipment Officer, 2nd Class; Sept. 18th.

General List.—The following Equipment Officers, 2nd Class, to be Temp. Cpts. (without the pay or allowances of that rank) while specially employed:—Temp. Lieut. C. H. Simpson, Gen. List; July 2nd. Temp. Lieut. P. Ellis, Gen. List; July 4th. Temp. Lieut. C. M. Seth Ward, Gen. List; Temp. Lieut. C. S. Willmott, Gen. List; July 16th. Temp. Lieut. J. M. Bell, Gen. List; July 18th. Temp. Lieut. W. J. King, Gen. List; July 28th. 2nd Lieut. (Temp. Lieut.) F. N. D. Masters, R.F.A. (T.F.); Aug. 1st. Temp. Lieut. H. N. Sandys, Gen. List; Aug. 4th. Temp. Lieut. R. C. Cox, Gen. List; Aug. 16th.

The following, from R.F.C., to be Temp. 2nd Lieuts.:—Sergt. F. L. Barnett, 2nd Class Air Mech. H. B. Norris, Act.-Corpl. S. G. Newport, Act.-Corpl. H. Cohen, Flight Sergt. G. W. Cox, Flight Sergt. H. S. C. Cann, Flight Sergt. G. Barnes, Corpl. H. A. Dinnage, Corpl. A. Broadley, Corpl. H. Moon, Sergt. R. A. Munday, Corpl. H. R. C. Van de Velde, Act.-Corpl. G. A. W. Garland, 1st Class Air Mech. R. H. Thomas, Act.-Corpl. G. L. G. Watson, Corpl. D. H. Fenner, Flight Sergt. E. Taylor, Sergt. M. L. Metcalfe, Corpl. W. J. Richards, Corpl. W. E. Lowrie, Corpl. J. H. Hunter, Sergt. W. Massey, Sergt. H. G. W. Lock, Sergt. R. L. H. Hulme, Sergt. S. W. Smith; Sept. 24th.

1st Class Air Mechs., from R.F.C., to be Temp. 2nd Lieuts.:—C. F. Lane, J. W. Power, J. T. Baugh, F. S. Mockford, C. T. Christie, S. C. Bown; Sept. 24th. To be Temp. 2nd Lieuts. (on prob.):—Pte. J. C. Ferguson, from O.T.C.; Pte. F. Reynolds, from O.T.C.; L.-Corpl. H. J. Kibble, from O.T.C.; Pte. W. S. Jackson, from A.S.C.; Act.-Sergt. R. R. Crosby, from H.A.C. (T.F.); Aug.

28th. Corpl. J. F. Earle, from R.F.C.; Sept. 15th. P. M. Maury; Sept. 22nd. Cdt. H. T. Buss, from R.F.C.; Oct. 26th.

Supplementary to Regular Corps.—2nd Lieut. H. Simson relinquishes his commission on account of ill-health (Oct. 13th).

Gen. List (R.F.C.).—Temp. 2nd Lieut. H. G. W. Matthews resigns his commission with a view to joining an Infantry Officer Cadet Battn. (Oct. 13th); Temp. 2nd Lieut. H. J. Ashley resigns his commission with a view to joining an Officer Cadet Battn. (Oct. 13th).

London Gazette Supplement, October 13th.

The following appointments are made:—

Squadron Commander.—Capt. (Temp. Major) J. V. Steel, R.A., from an Instructor (graded as a Sqdrn. Comdr.), Schools of Inst., and from a Flight Comdr., and to retain his temp. rank whilst so employed; Sept. 19th.

Flight Commanders.—From Flying Officers. Temp. Capt. R. D. Simpson, Gen. List; Sept. 25th. Lieut. R. I. Van der Byl, Canadian Gen. List, and to be Temp. Capt. whilst so employed; Sept. 26th.

Flying Officers.—Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: R. W. Ryan, S. D. Carpenter, H. A. F. Goodison; Sept. 21st. H. H. D. Bothamley, R. A. Curry, H. O. Prout, M. S. C. Gordon, D. W. Ross; Sept. 22nd. J. N. Bardsley, J. F. M. Kerr; Sept. 24th. Temp. 2nd Lieut. S. W. Smith, Gen. List; Temp. 2nd Lieut. (on prob.) G. R. Gray, Gen. List, and to be confirmed in his rank; Sept. 27th. The appointment of Temp. 2nd Lieut. J. E. Bonniksen, Gen. List, notified in *Gazette* of June 20th, to be ante-dated to April 25th.

Flying Officers (Observers).—Date of seniority of Temp. 2nd Lieut. J. W. Ferguson, K.O. Sco. Bord., is Jan. 25th, and that of 2nd Lieut. S. S. Jones, M.C., S. Lan. R., S.R., March 28th, and not as in *Gazettes* of Sept. 18th and Aug. 14th respectively.

Assistant Instructors in Gunnery (graded as Equipment Officers, 2nd Class).—Temp. Capt. A. R. Thomson, M.C., Gen. List, from a Flying Officer; 2nd Lieut. R. R. Macgregor, R. Sco. Fus. (T.F.), to be Temp. Lieut. whilst so employed, and to be sec'd.; Sept. 18th.

Balloon Officer.—2nd Lieut. G. D. Machin, Hamps. R., S.R., and to be sec'd.; Sept. 23rd.

Equipment Officers, 2nd Class.—From the 3rd Cl.—Lieut. H. Wing, S.R.; Aug. 2nd. And to be Temp. Lieuts. whilst so employed: Temp. 2nd Lieut. E. J. Phelps, Gen. List; 2nd Lieut. F. Jewell, S.R.; Temp. 2nd Lieut. J. L. Denman, Gen. List; Oct. 1. 3rd Class.—Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: N. Feather; Aug. 17th. K. G. Courage; Aug. 29th. S. N. Cooke, W. W. Bull; Sept. 24th.

General List.—Temp. 2nd Lieut. W. W. A. R. Murdoch resigns his commission on account of ill-health, and is granted the hon. rank of 2nd Lieut.; Oct. 14th. Cadet J. F. George, from R.F.C., to be Temp. 2nd Lieut. (on prob.); Sept. 28th.

Supplementary to Regular Corps.—Lieutenants to be Captains.—(Temp. Major) C. P. Ogden, (Temp. Major) L. M. Bennett, (Temp. Major) S. H. B. Harris, (Temp. Major) G. L. P. Henderson, M.C., (Temp. Major) H. L. Cooper, (Temp. Major) M. E. Lane, (Temp. Major) C. Barber, (Temp. Capt.) R. H. Mayo, (Temp. Capt.) C. H. Pixton, (Temp. Major) L. W. Learmount, D.S.O., M.C., (Temp. Major) H. A. Oxenham, (Temp. Major) G. D. Hannay, (Temp. Major) H. MacD. O'Malley, (Temp. Major) J. P. C. Cooper, M.C., (Temp. Major) F. S. Creswell, (Temp. Major) F. A. G. Noel, (Temp. Capt.) J. W. Woodhouse, D.S.O., M.C., (Temp. Capt.) G. D. Pidgeon, (Temp. Maj.) B. C. McEwen, M.C., (Temp. Major) L. W. F. Turner, (Temp. Major) C. Hirtzel, (Temp. Major) G. E. W. Humphrey, (Temp. Major) G. S. Peacock, (Temp. Major) F. F. Minchin, M.C., (Temp. Major) A. T. Whitelock, (Temp. Major) K. K. Horn, (Temp. Major) J. H. Herring, D.S.O., M.C., (Temp. Major) R. F. S. Morton, (Temp. Major) V. D. Bell, (Temp. Major) J. P. C. Sewell, (Temp. Major) C. C. Miles, M.C., (Temp. Major) H. Lee, (Temp. Major) G. L. Main, (Temp. Major) C. G. Smith, (Temp. Major) A. T. Watson, (Temp. Major) S. S. Kennedy, (Temp. Major) A. K. Tylee, (Temp. Major) J. W. Jardine, (Temp. Major) C. R. Huggins, (Temp. Capt.) M. O. Darby; Sept. 1st. (Temp. Major) G. I. Taylor, (Temp. Major) T. G. Clarkson; Sept. 2nd. (Temp. Major) H. G. Gold; Sept. 4th. 2nd Lieuts. (on prob.) confirmed in their rank: J. R. Moore, D. French.

General List (R.F.C., Military Wing).—Temp. 2nd Lieut. J. A. C. Coston resigns his commission with a view to joining an Infantry Officer Cadet Battn.; Oct. 14th.

London Gazette Supplement, October 15th.

The following temp. appointments are made at the War Office:—

Assistant Director.—Major J. H. A. Landon, D.S.O., Essex R. (T.F.), from a Sqdrn. Comdr., R.F.C., and to be Temp. Lieut.-Col. whilst so employed, vice Major W. D. Beatty, R.E.; August 13th.

The following appointments are made:—

Flight-Commanders.—From Flying Officers, and to be Temp. Cpts. whilst so employed: Lieut. F. J. Miller, Spec. Res.; September 7th. Temp. Lieut. H. G. E. Luchford, Gen. List; September 11th.

Flying Officers.—Temp. Lieut. H. G. E. Luchford, A.S.C., and to be transferred to R.F.C. Gen. List; May 19th. Temp. 2nd Lieut. A. Koch, Gen. List, from a Flying Officer (Ob.); September 21st, seniority August 4th, 1916. 2nd Lieut. A. E. Bush, Spec. Res., from an Equipment Officer, 3rd Cl.; 2nd Lieut. (on prob.) W. F. Warner, Spec. Res.; Sept. 23rd. Temp. 2nd Lieut. (on prob.) S. W. Poore, Gen. List, and to be confirmed in his rank; 2nd Lieut. J. L. Andrew, Spec. Res., from an Equipment Officer, 3rd Cl.; Sept. 24th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: F. W. Evans and E. Wornell.

Flying Officers (Observers).—Lieut. E. Alder, Canadian Inf.; Sept. 26th, seniority April 28th. Sept. 26th, seniority July 5th: 2nd Lieut. F. Whitehead, Yeo. (T.F.), and to be sec'd.; Temp. 2nd Lieut. G. C. Smale, Leic. R.; 2nd Lieut. M. A. O'Callaghan, Yeo. (T.F.), and to be sec'd.; Sept. 25th, seniority from July 16th. 2nd Lieut. E. Dixon, W. Rid. R. (T.F.), seniority from July 30th, and to be sec'd.; 2nd Lieut. R. H. Richardson, Lond. R. (T.F.), seniority from Aug. 15th, and to be sec'd.; Sept. 26th. 2nd Lieut. J. B. M. Barnum, R.F.A., Spec. Res., seniority from Sept. 3rd.

Assistant Instructor in Gunnery.—(Graded as an Equipment Officer, 2nd Cl.).—Temp. 2nd Lieut. H. E. Went, Gen. List, from an Asst. Instr. in Gunnery (graded as an Equipment Officer, 3rd Cl.), and to be Temp. Lieut. whilst so employed; Aug. 24th.

Balloon Commander.—(Graded as a Balloon Officer).—2nd Lieut. D. C. Bell, Midd'x R. (T.F.), from a Balloon Officer, and to be Temp. Lieut. whilst so employed; Aug. 2nd.

Equipment Officers, 2nd Class.—Lieut. G. F. Golding, Spec. Res., from the 3rd Cl.; Sept. 30th.

3rd Class.—Temp. 2nd Lieuts. (Gen. List) G. Barnes, F. L. Barnett, J. T. Baugh, S. C. Bown, A. Broadley, H. S. C. Cann, C. T. Christie, H. Cohen, G. W. Cox, H. A. Dinnage, D. H. Fenner, G. A. W. Garland, R. L. H. Hulme, J. H. Hunter, C. F. Lane, H. G. W. Lock, W. E. Lowrie, W. Massey, M. L. Metcalfe, F. S. Mockford, H. Moon, R. A. Munday, S. G. Newport, H. B. Norris, J. W. Power, W. J. Richards, E. Taylor, R. H. Thomas, H. R. C. Van de Velde, G. L. G. Watson; Sept. 24th.

Schools of Military Aeronautics.

Instructor.—Graded as a Flight Comdr.—Temp. 2nd Lieut. C. G. Durham, Gen. List, a Flying Officer (Obs.), and to be Temp. Capt. while so employed; Sept. 26th.

Assistant Instructor.—Graded as a Flying Officer.—Lieut. C. L. Willcox, Spec. Res., a Flying Officer; Oct. 1st.
Graded as an Equipment Officer, 2nd Cl.—Temp. 2nd Lieut. A. L. Hyslop, Gen. List., an Equipment Officer, 3rd Cl., and to be Temp. Lieut. while so employed; Sept. 26th.

Equipment Officers School of Instruction.

Chief Instructor (graded as a Park Commander).—2nd Lieut. (Temp. Capt.) G. J. Read, N. Staffs. R., Spec. Res., from an Instr. (graded as an Equipment Officer, 1st Cl.), School of Mil. Aeronautics, and to be Temp. Major while so employed; Aug. 17th.

Instructor (graded as an Equipment Officer, 1st Class).—2nd Lieut. (Temp. Lieut.) W. F. Bryant, R.W. Surr. R., an Equipment Officer, 2nd Cl., and to be temp. Capt. while so employed; Aug. 17th.

Assistant Instructors (graded as Equipment Officers, 2nd Class).—Temp. Qrmr. and Hon. Lieut. (Temp. Lieut.) H. C. Gaze, R. Fus., from an Asst. Instr. (graded as an Equipment Officer, 2nd Cl.), School of Mil. Aeronautics, and to retain his temp. rank whilst so employed; Temp. Lieut. D. O'B. Gill, R.E., an Equipment

Officer, 3rd Cl.; and to be Temp. Lieuts. whilst so employed: 2nd Lieut. W. Thorne, an Equipment Officer, 3rd Cl.; Temp. 2nd Lieut. (on prob.) D. R. M. Wright, Gen. List., and to be confirmed in his rank; Aug. 17th.

Examining Officer (graded as an Equipment Officer, 1st Class).—Temp. Lieut. J. A. Payne, Gen. List., from an Asst. Instr. (graded as an Equipment Officer, 2nd Cl.), School of Mil. Aeronautics, and to be Temp. Capt. whilst so employed; Aug. 17th.

General List.—2nd Lieuts., Spec. Res., to be Temp. Lieuts.: C. H. Lick; June 26th. W. G. Stuart, D. S. Thompson; July 24th. R. H. Little; Aug. 23rd. 2nd Cl. Air-Mech. H. A. Creswell, from R.F.C., to be Temp. 2nd Lieut. (on prob.); Sept. 1st. Temp. 2nd Lieut. G. H. Griffiths resigns his commission with a view to joining an Inf. Off. Cdt. Bn.; Sept. 26th (substituted for Gazette notification Sept. 25th, page 9927, incorrectly describing initials as E. H.).

Aeronautical Inspection Department.

London Gazette Supplement, October 10th.

R. E. Cragg to be Temp. Hon. Lieut. whilst employed as an Assistant Inspector, Aeronautical Inspection Department (Dec. 9th, 1916).

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters, October 9th.
 "The weather was even more unfavourable for flying on the 8th inst. than on the previous days. Much work was, however, done in aerial reconnaissance, and some artillery work was successfully carried out. Two enemy machines were driven down out of control. Ground targets were also attacked with machine-gun fire. Two of our aeroplanes are missing."

General Headquarters, October 10th.
 "On the 9th inst. little flying took place, except on the battle-front, where a great deal of work was done, in spite of a strong gale and thick clouds. The enemy's new gun positions and other suitable targets were reported by our aeroplanes to our artillery, which dealt with them. Touch was kept with our infantry all day, and the enemy's troops were harassed by machine-gun fire at every opportunity. A ton of bombs was dropped on Staden during the day, and at night two tons were dropped on Roulers, Courtrai, Menin and Ledeghem stations. A direct hit was obtained on a hostile train, causing a number of explosions. In air fighting four German machines were brought down, and two others were driven down out of control. Two of our machines are missing."

General Headquarters, October 11th.
 "On the 10th inst. stormy weather continued, and flying was only possible in the early morning and in the evening. These opportunities were taken by our machines to carry on artillery and photographic work, and a number of bombs were dropped by us on hostile billets and hutments, and upon a German big-gun position. In air fighting three enemy machines were brought down, and two were driven down out of control. Four of our machines are missing."

Admiralty, October 11th.
 "In the last 24 hours, October 9th-10th, patrols were carried out by the R.N.A.S., during which enemy trenches were attacked by machine-gun fire. One pilot, on being heavily shelled by anti-aircraft guns, descended and attacked the guns' crews, scattering them and silencing the guns."

"Early yesterday morning (October 10th) bombing raids were made on the following military objectives: Thourout railway junction and trains. Lichtervelde railway junction and trains. Large quantities of explosives were dropped. All machines returned safely."

General Headquarters, October 12th.
 "On the 11th inst. every opportunity was taken by our aeroplanes to reconnoitre the enemy's positions and to carry on artillery and photographic work during the intervals of clear weather. A large number of bombs were dropped by our machines on hostile billets, and machine-gun fire was opened from a low altitude upon the German infantry in their trenches. One hostile machine was brought down yesterday in combat, and another was shot down by our infantry. Two other enemy machines were driven down out of control. Five of our aeroplanes are missing."

Admiralty, October 12th.
 "Yesterday afternoon, in spite of heavy clouds and rain, naval aircraft carried out a bombing raid on Sparappelhoek aerodrome. Many bombs were dropped. All machines returned safely."

General Headquarters, October 13th.
 "On the 12th inst. the weather could not have been less favourable for the co-operation of our aeroplanes with our infantry in their attack. None the less, machines went out till 4 p.m., both in the rain and during fine intervals, and with great difficulty succeeded in locating the position of our troops. The movements of the enemy were watched, and a great many hostile batteries were located and reported to our artillery. In addition to this work over 10,000 rounds were fired by our aeroplanes from machine-guns at hostile infantry in trenches and shell-holes, and on the roads. Parties of mounted troops and convoys of hostile transport were also engaged from low altitudes, causing many casualties and great confusion. Only a few German machines were encountered, presumably on account of the bad weather, and little fighting took place in the air. Four enemy aeroplanes were brought down and five others were driven down out of control. Ten of our aeroplanes are missing. The very strong west wind and the suddenness with which storms of driving rain came up accounted for the non-return of many of our machines. Several of those missing

belonged to patrols which were not engaged in fighting and evidently were lost in the storms."

General Headquarters, October 14th.
 "Owing to the weather, very little flying was done on the 13th inst. In the fine intervals a certain amount of artillery and photographic work was accomplished, and the enemy's new positions were reconnoitred."

"One of our patrols encountered an enemy formation of double the number of machines, and a determined fight took place, from which four of our aeroplanes failed to return. Owing to the close nature of the fighting the number of hostile machines accounted for could not be determined by our pilots. Other Allied machines, which arrived too late to take part in the fight, saw from a distance several machines falling out of control."

Admiralty, October 14th.
 "On the 13th, owing to unfavourable weather, operations by naval aircraft were restricted."

"One of our fighting patrols, however, during the forenoon shot down an enemy machine over Ostend, which was observed going down in flames."

War Office, October 15th.
 "Salonica.—Our aeroplanes have dropped bombs on a dump at Cestovo, north-west of the lake, and on a railway train entering that place."

General Headquarters, October 15th.
 "On the 14th inst. there was a slight improvement in the weather. Artillery work and photography were carried out by our aeroplanes, and one and a half tons of bombs were dropped on Ledeghem railway station and on hostile billets east of Lens. In air fighting three German aeroplanes were brought down and one was driven down out of control. Two of our machines are missing."

French.
 "Our airmen, in spite of a tempestuous hurricane, actively co-operated in the attack, using their machine-guns at a low altitude against the enemy infantry, and assuring association with the other arms."

Paris, October 15th.
 "German airmen bombarded the Dunkirk region last night. There were several victims among the civil population."

"Two German captive balloons were brought down to-day, one by the fire of our special guns, the other by one of our airmen."

Russian.
 "On October 8th 14 enemy aeroplanes approached Cerel; some of them fired mines on our transports at Ajtchod. On October 9th, at 7 a.m., eight enemy aeroplanes attacked without result the batteries at Cerel and the village of Mendo, six miles north-east of Cerel."

Petrograd, October 13th.
 "During the numerous aerial reconnaissances and engagements in the region of the Oesel Island our aviator Galaktionoff brought down an enemy aeroplane, which fell to the ground."

Petrograd, October 15th.
 "Enemy naval and aerial forces are energetically supporting their land operations (in the Gulf of Riga) and are attacking north and south of the island (Oesel)."

Roumanian.
 "On October 12th four enemy aviators bombed the city of Galatz, and, descending to a very low altitude, fired with their machine guns, causing a number of victims amongst the population."

German.
 "In an aerial battle which developed in the evening over Zonnebeke-Zandvoorde, in which about 80 aeroplanes participated, three enemy aviators were shot down."

"The losses sustained by the enemy aerial forces in September on the German fronts amount to 22 captive balloons and 374 aeroplanes, of which 167 were behind our lines. The remainder were seen to have been brought down beyond the enemy positions. In encounters we lost 82 aeroplanes and five captive balloons."

The Work of the Air Board.

PRESIDING at a lecture entitled "Over the Lines" given by Mr. Boyd Cable on October 10th, Lord Cowdray, President of the Air Board, said that he (Lord Cowdray) was primarily concerned with the production of as many aeroplanes as could be designed and produced of the best possible types for the need of the air service. Their particular use in the field was for the fighting services to arrange.

Critics were apt to forget that there were limits to the supply of skilled labour and of those kinds of raw material which were indispensable for the construction not only of aircraft but also for other instruments of war. The shortage of some of this material—and he meant not only of local stocks but of world stocks—arose partly from the enormous developments of the mechanical side of warfare and partly from the necessities created by the orgy of destruction in which the world had been involved for the past three years.

At the present time an increased production in one direction

almost inevitably involves decreased production in another. Our output of aeroplanes and seaplanes had been enormously increased, and must be considered as highly satisfactory. This, however, did not mean any relaxation of effort.

There was nothing in this way more wonderful or more successful than the air service, especially when it was remembered that this new fighting force had been created, for all practical purposes, during the war. It had at the same time become the eyes of the Army, the scouts of the Navy, the terror of the submarine, and will be by no means an inconsiderable factor in determining that final victory which would compel their foes to sue for peace on terms that would secure, he believed for all time, right and freedom to mankind.

Mr. Boyd Cable in the course of his lecture, which was illustrated by photographs taken from the air, dealt with the use and value of aircraft in war, and showed what service they rendered to the fighting men.

INSPECTION AND OTHER MATTERS.

In introducing Lieut.-Col. R. K. Bagnall-Wild, the new President of the Institution of Automobile Engineers, at the general meeting on October 10th, Mr. L. A. Legros, the outgoing President, in commenting on the work of Lieut.-Col. Bagnall-Wild as Chief Inspector of the Aeronautical Inspection Department, said that in his four years of office he had organised a body of 5,000 inspectors, recruited from every class of trade, including many quaint and odd employments. He had heard of one aeroplane worker who used to make the dots on dominoes, and another who once put the nicks in penknife blades. He had no doubt that inspectors could be found who used to dot the "i's" on tombstones. Only war revealed these curious employments. In the erection of aeroplanes the man who shone best and was most useful was the organ-builder. He stood head and shoulders above everyone else, and was followed by the pattern-maker; but in propeller work, where the pattern-maker might be expected to be first, the man who came out best was the chair-maker.

Lieut.-Col. Bagnall-Wild, on taking the chair, delivered his presidential address, in the course of which, after referring to the continued growth of the Institution and the useful work it had accomplished, he said:

"There is a point to which I should like briefly to refer, especially with regard to 'overlapping,' and that is the relation between the Institution and the aeronautical industry. I am personally of the opinion that during the coming year the Institution will have its hands full on what may be termed the motor interests proper, though many of these interests must necessarily overlap those of the aeronautical side. This is essentially so with regard to materials, and as a typical example I should like to mention the valuable work done by the Institution during the past year in connection with steels. The Engineering Standards Committee have issued a Report, No. 75, giving specifications for automobile steels covering a wide range. I am justified in saying that this publication was made at the instigation of the Institution. Much work, however, still remained to be done. These specifications had to be proved and amplified, funds were required to carry out the work, and these were furnished willingly by the Admiralty, the War Office and the society and trade generally. These funds, in themselves, would not have been sufficient to carry out all the research necessary, but most noble assistance has been rendered by the steel makers themselves, who have not only given us the steel, but they have carried out the forging and rolling into bars free of all cost. This is a big item.

"These steels are used not only for automobile construction, but also for aeronautical work, both planes and engines. In my personal opinion, however, there is every indication that all aeronautical matters can safely be left in the hands of the Joint Committee of the Aeronautical Society and the Society of British Aircraft Constructors. Such being the case, I do not see that the Institution need interest itself with problems of flight, neither should it necessarily concern itself with the aero engine. A fact which is not always recognised is that the aero engine is totally unsuited for automobile work; the average horse-power at the present time is in the neighbourhood of 200, cost enters less into its construction than superiority of material and lightness, while durability is looked at from an entirely different point of view.

"Having in view the fact that we can only do a certain amount of work in a given time, I consider that during this session we shall have our hands fully occupied with what I should like to term our legitimate sphere, but as I have already stated, we do overlap with other industries. Why should the Institution and the Aeronautical Society be considered as any different from, let us say, the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Institution of Electrical Engineers, or any other kindred body? It might more truly be said that our work on steel is usurping the province of the Iron and Steel Institute; I think the policy of each institution or society should be to confine itself, primarily, to its legitimate work, and when branches of this work spread into other industries, then invite the co-operation of those concerned."

Lieut.-Col. Bagnall-Wild then gave an address on the subject of "Inspection," giving in detail the reasons for inspection and the organisation best fitted, in his opinion, to attain the desired end. In the course of his remarks he referred to French methods as follows:

"I recently had an opportunity of studying the French Government system of inspection, and it is interesting to note that it is almost exactly on similar lines to that adopted by me. It is not astonishing to note that the number of the inspection staff is in some cases rather less than

that found necessary by me in England, as this is readily accounted for by the fact that labour is not diluted to anything like the extent it is in England. The following brief *résumé* of the inspection system in this particular industry in France is, therefore, of interest:—

"The fundamental principles of inspection adopted by the French are almost identical with our own, but their method of applying these principles differs in many details. The labour is almost entirely undiluted and of a very high average skill. At the works visited very few jigs and labour-saving devices were employed, the individual skill of the workmen being trusted to, with apparent success.

"Ease of production seems to have been most carefully considered by the designers. Details would appear to be designed, primarily, from a manufacturing point of view. It was particularly noticeable that the woodwork was often more elaborate than in English designs, while the mental work was cut down to the minimum. The number of employees relative to the size of the works appeared to be much higher than in England.

"An officer, with a certain number of subordinates, is stationed at the works of each main contractor. It is his duty to see that only approved material is used and that each detail part, when finished, is viewed, and stamped if approved. Components are again viewed, in many cases several times at various stages to see that the workmanship is satisfactory and that approved details only have been used. Finally, the assembly of components into a complete machine is inspected at several stages, before the machine is passed.

"Material is supplied by approved firms only, at most of whose works there are resident inspectors, more particularly where high tensile steel or tubing is produced. The majority of the mild steel and practically all timber is inspected on arrival at the main contractors' works. Finished details and accessories, where sub-contracted for, are supplied only by approved firms and inspected by either resident or visiting examiners.

"The practice of returning to a sub-contractor any material which had not been approved before despatch to the main contractor is always strictly adhered to, except in cases of extreme urgency. Timber is usually inspected at the main contractor's works, but frequently test pieces are taken and sent to headquarters for physical tests. These are, however, considered more in the light of educative information for the timber examiner than as a part of the acceptance procedure.

"The process inspection of the various components and the final inspection of the machine appears to be excellent.

"With regard to design it would appear that far less sub-contracting is done in France, and, therefore, the question of parts made by a sub-contractor fitting a part made by a main contractor hardly arises.

"The practice of employing only 'approved' firms, each of whom has been proved to be capable of making certain parts correctly before being placed on the 'approved' list, and can, therefore, be trusted to repeat correctly such parts, would seem to have had most excellent results and to be worthy of early adoption to a much greater degree in this country."

Conclusion.—Summing up, Lieut.-Col. Bagnall-Wild gave his conclusions as follows:

"It is obvious that to obtain increased output we must develop and expand the works of existing contractors. The conditions in this country will, therefore, approximate more and more closely to the conditions in France, in that we shall have to rely upon the contractor for detail examination and concentrate our examiners on process inspection of components and on assembly. It is, therefore, urged that this expansion of the main contract be very closely coupled with a strict control of the sub-contractor. The sub-contractors who have successfully turned out certain details with a low percentage of rejections should concentrate on these details and be expanded as necessary, new firms only being approved when all other sources of supply fail, and firms with large percentages of rejections removed altogether from the list. It is thought that much more might be done in this country to educate firms who waste material by their high percentage of scrap, or failing that to shut them down and make greater use elsewhere of the labour thus released.

"Inspection is essential to obtain efficient output. It is the only method whereby the directors of a company can ascertain the quality of the firm's output: it is their only safeguard that money, time and material is not being wasted in the production of scrap; it is a check on their purchasing department; it is a check on their design and drawing office, and it is even a check on their chief engineer, to whom the inspection branch is responsible. Facts will always speak,

and the inspection department can at any moment produce figures showing rejections at any stage from the purchased raw material to the completed and finished article.

"I do not consider that nearly enough attention has been given by managing directors and managers to the valuable data available in the inspection department.

"It has been suggested to me that a full Government system of inspection is but a duplication of work. For a long time I have had available a record showing rejections by the firms and rejections by me. These figures, of course, also give the percentage rejections on the total output, and they must, surely, be of vital importance, not only from the output point of view, but financially. A little more money spent on inspection, not only increases dividends, but brings in more

orders. The better the article, having due regard to cost, the greater its popularity with the purchaser."

"The inspector, as a rule, is nobody's friend. This is not always his fault, it is a fault of the whole system, he should be encouraged to be human. He must not be on unduly intimate social terms with the production staff, but he must be capable of dealing with them with tact and cordiality.

"I am certain that if more attention were paid and more encouragement given to the class of man employed by firms for this purpose, much better results would be obtained.

"So far as I, personally, am concerned, I invite criticism and co-operation, and am at all times willing to listen to suggestions which will further desirable output."

SIDE-WINDS.

In his speech at the annual general meeting of the Birmingham Small Arms Company, Ltd., on October 12th, Sir Hallett Rogers, Chairman of the Company, said that the cycle department although occupied, to some extent, with its original work for British and Allied Governments, had been largely devoted to the manufacture of parts of aero engines and aeroplanes. The Daimler Company's works also had been given over entirely to the supply of Government requirements. In the early stages of the war the manufacture of military vehicles for a time occupied the whole works. Later extensions of the works were undertaken for the manufacture of aircraft, engines, and complete aeroplanes.

In view of the advantage of case-hardening for certain purposes, special interest attaches to the Alundic paste for surface hardening, which is a speciality of Messrs. A. Lund

and Co., Ltd., of Caxton House, Westminster, S.W. Alundic is a thick black paste, so thick as to be almost solid, which melts immediately on contact with the hot metal, re-solidifying just as rapidly on the withdrawal of the metal. One of the chief advantages of the system is its simplicity; the tool or mild steel object is heated to redness, plunged into the paste, and withdrawn after stirring for a few seconds. It is then reheated to bright red and quenched. It is also economical, since only sufficient paste is withdrawn each time, and it is claimed that the film of paste being uniform renders the result certain every time. The hardness and cleanliness of the surface, together with a non-liability to rust, are also important considerations. Those who wish to make a trial may obtain small quantities at 2s. 6d. a pound, while for ordinary use it can be obtained in 14 and 28 lb. kegs, resulting in a saving in cost.



At the opening of the New Recreation Ground of the British Caudron Co. at Wembley.—Top picture: Sir William Ramsay, A.M., surrounded by members of the firm, opening the ground. Bottom picture: The Caudron No. 1 football team.

ALTHOUGH it was obvious that the recent Sopwith Sports were a great success, in so far as the amount by which the Flying Services Fund would benefit, it was hardly anticipated that the amount would be as high as £125. That is, however, the figure on the cheque which has just been handed over, and it is something of which the Sopwith Aviation Company and its staff and employees may well be proud. It will certainly spur the band of workers who laboured so enthusiastically recently to still greater efforts next year. The gate receipts totalled £52 7s. 6d., the tickets sold realised £46 16s. 6d., while the draw for the beautifully made model of the Schneider Cup winner brought in £16 3s. 6d.

WITH the object of assisting the Italian Blue Cross Fund, which has already sent back 8,000 horses to the front, a "sporting chance" under the patronage of H.M. the King of Italy, has been arranged by Lady Rodd, wife of the British Ambassador in Rome. There are only two prizes, but they are (1) a silver toilet set, offered by the King of Italy, and (2) a 35 h.p. car with torpedo body, presented by Lancia and Company, of Turin. The tickets are 1s. 6d. each, and can be obtained from Messrs. W. L. Stewart and Co., Ltd., 26, Albemarle Street, Piccadilly, W. 1, who are the sole concessionaires for Lancia cars. The drawing is to take place in Rome in February, 1918.

JUDGING by the exhibition of form displayed by the British Caudron Works football team on Saturday last, on the occasion of the opening of their new recreation ground, they bid fair to provide visiting teams with opposition worthy of their best efforts.

The ground is handily situated just outside Preston Road Station on the Metropolitan Railway, just beyond Wembley, is of good size, perfectly flat, and boasts an up-to-date and comfortable pavilion.

Following on a little friendly luncheon at the Victoria Hotel, Cricklewood, the ground was formally opened by Sir William Ramsay, A.M., the first match being one between the British Caudron team and that of the Aircraft Manufacturing Co., in which the visiting team lost by 7 goals to 2. A concert was held in the evening on a return being made to Cricklewood, at which many old Hendon friends were present. Referring again to the match, the Caudron team played a fine game, their men keeping position so well that the ball was passed from man to man with all the certainty of an international team, also their "footwork" was remark-

ably good and steady, so the resulting scores were not remarkable. No doubt but that the Aircraft team will endeavour to even things up on the return match being played, but on this particular occasion the Caudron boys were, in "footer" language, "all over them."

AN interesting ceremony was performed on Tuesday when the Lord Mayor, Colonel the Right Hon. Sir William H. Dunn, Bart., raised the sluice-gates at Hanworth Park, thus diverting Cardinal Wolsey's river from its old course to the underground conduit constructed to receive it. It will be known to those who have visited this new aerodrome that the river ran right across the middle, thus materially detracting from the value of the site for the purposes required. It was a great undertaking thus to turn the river from its original course, but the genius and enterprise of Mr. Whitehead is equal to all such problems. A concrete duct was constructed underground, and when the Lord Mayor turned the switch on Tuesday, the ancient river that was made in order to supply Hampton Court Palace with water, turned on itself and started to flow in the opposite direction for the first time.

It was an exceedingly rough and stormy day, with a forty-mile or so wind keeping the flags outstretched, and raining hard, yet to fulfil the conditions usually provided on all "Whitehead" days, that was an exhibition flight, Herbert Sykes went up on his Martinsyde and put up a priceless flight, looping the loop many times and liberating showers of pamphlets. In landing he glided in just over the flagpoles, with engine off, the machine rocking like a ship at sea. He made a perfect landing after a flight such as is seldom seen under such bad conditions and is to be congratulated that his nerves have suffered no ill effect from his recent bad accident.

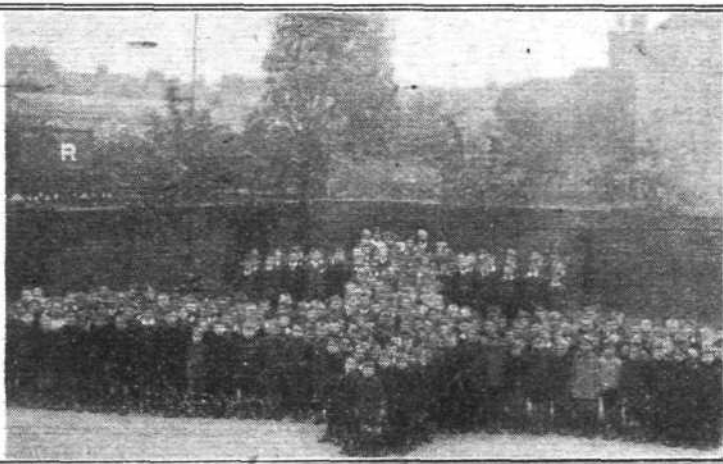
It is of interest to note that the engine of the S. I. A. biplane on which Capt. the Marquis Laureati flew from Turin to London, was equipped with Dixie magnetos. The American Supplies Co., Ltd., of 162, Great Portland Street, W. 1, handle the Dixie in this country.

OWING to their offices at St. Stephen's House having been requisitioned by the Food Controller the Society of British Aircraft Constructors have moved to 1, Albermarle Street, W. 1. The telephone call is now Regent 5641, and the telegraphic address, Thesbae, Percy, London.

Presentation of the Manio Cup.

ON Wednesday, October 10th, Brig.-Gen. L. Charlton, C.M.G., D.S.O., at St. John's Boys' School, Ealing, presented the Manio Cup, which is annually awarded for the best essay on "Aviation," written out of school hours. The cup, which

was presented by Mrs. Manio, has now been won by W. Kerswell, S. Tompkins, S. Drury, and A. Bradford. On the occasion of the recent presentation, the 330 boys at the school were drawn up in an aeroplane formation, as seen in one of our photos.



The presentation of the "Manio" Cup and Diploma at St. John's Boys' School, Ealing, by Brig.-Gen. L. Charlton, C.M.G., D.S.O., of the Army Aeronautical Directorate. In the group are Brig.-Gen. L. Charlton, in uniform, on the right, Mrs. J. B. Manio, and Mr. E. J. Gollidge, Head Master. The photograph on the right is an ingenious formation of a human aeroplane, composed of 300 boys of St. John's School.

A Poison Plot in America.

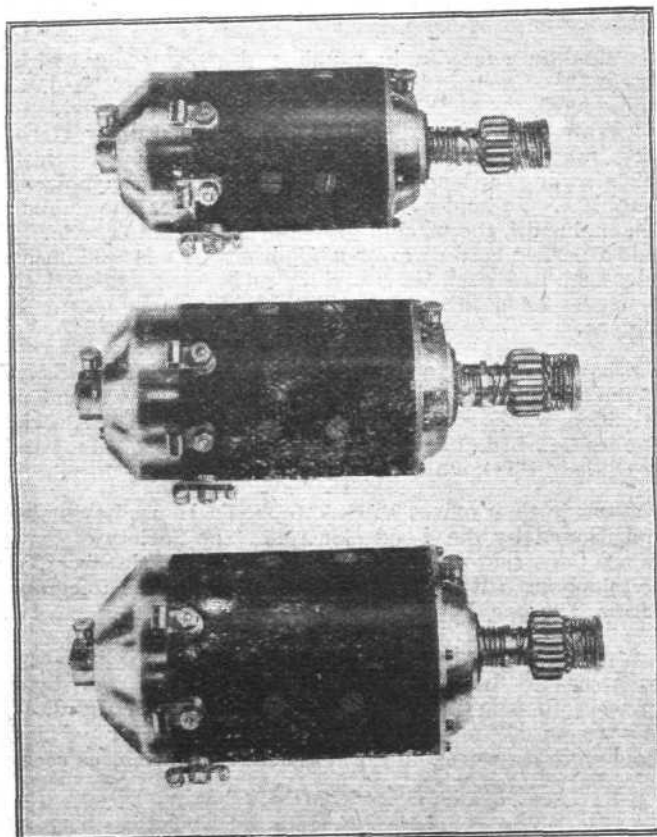
ACCORDING to a message from New York, a sensational affair is reported at the Princeton aviation school. A student named Samuel Livingood has been sent to Governor's Island to await a court-martial, as the result of the discovery in his trunk of poison sufficient, it is declared, to kill a thousand persons.

A Bulgarian Aeroplane Factory.

THE Bulgarian Ministry of War has given permission to a syndicate of German experts to erect an aeroplane factory in Sofia, promising State support, conditional on the works embracing also a flying school capable of training at least ten pilots per month. The financing of the undertaking will be done by a Bulgarian company.

THE C. A. V. ELECTRIC STARTER.

In the field of electrical work, anything which bears the initials C. A. V. commands attention. Recently Messrs. C. A. Vandervell and Co. have produced an electric engine starter which has been designed not only for motor car engines but also for such large motors as those for aeroplanes, tanks, &c. There are three models, in fact, as seen in our photograph, the only difference being in the size. Mechanically, the broad scheme of the C. A. V. starter is the not unfamiliar dynamo-pinion slid into—or out of—engagement with a toothed-ring on the fly-wheel. The originality is in the application thereof. The field area is considerably longer than that of the armature flux. Consequently the battery current can be—and is—switched in by a two-stage plunger motion, so as to energise the fields progressively forward and thus draw the armature—the shaft of which is free to slide endwise—out of magnetic centre. This is effected mechanically in a manner resembling—though not electrically the same as—a rheostatic



THE LATEST C.A.V. PRODUCT.—The motor-starting dynamo, made in three sizes to cover all kinds of starting-loads. The smallest above, "ZC," is suitable for motors up to 16 h.p.; the middle one, "ZB," for up to 40 h.p.; and the largest, "ZA," for the most powerful racing cars, aero, "Tank," and marine motors up to about 150 h.p. Note the clean design and oil, moisture, and dust-proof construction embodied in all three sizes.

action within the switch-box; and is completed at the full plunge of the switch. This puts the pinion into mesh; the energised dynamo runs to start the motor; and as soon as the latter over-runs the dynamo-speed a strong return spring on the dynamo spindle withdraws the pinion from mesh. Sixty-six consecutive starts on the dynamo used for starting "Tank" motors is the record. It was not tried further for lack of necessity to do so. As made, this dynamo, like other Vandervell products, could not be better made.

NEW COMPANY REGISTERED.

AUSTRALIAN AIRCRAFT CO., LTD., 67, New Oxford Street, W.C.—Capital £1,000, in £1 shares. Agents for, manufacturers of and dealers in aeroplanes, airships, &c., motors applicable to the above, &c.

BUSINESS NAMES REGISTRATIONS.

W. SWAIN AND CO.—Registered October 3rd, 1917. Electrical engineers and accumulators specialists. 269, Putney Bridge Road, S.W. (15). Proprietor: William J. Swain (British), above address. Other business occupation: Examiner aeronautical inspection directorate.

LEGAL INTELLIGENCE.

Wells Aviation Co.

In the Companies Winding-Up Court, on October 16th, counsel for the petitioners, Whiteman and Moss, informed Mr. Justice Astbury that since their petition for the compulsory winding-up of Wells Aviation Co. was filed, the respondent company had gone into voluntary liquidation and the liquidators had arranged for the sale of the assets, which would give a satisfactory dividend to the creditors. In these circumstances he asked that the petition be dismissed, without costs.

Mr. Turner, for a creditor supporting the petition, said the proposal was absolutely new to his client, and it might be that he would desire to be substituted as petitioner.

Mr. Austen Cartmell, for the Secretary for War, a debenture holder, said the scheme was one which he accepted, but he would not stand in the way of any rights the creditors had.

His Lordship said the great majority of the creditors approved of the scheme, and he would dismiss the petition, but postpone the order, to give Mr. Turner's client an opportunity next week of moving in the matter. His Lordship warned Mr. Turner that he might move at his peril as to costs.

The petition accordingly stood over for a week.

Air Raids and Compensation.

In the Bow County Court on October 15th, arguments were heard in a claim, made under the Workmen's Compensation Act, by Henry Charles Allcock, a potman. He asked for an award from G. A. Rodgers, publican, of the Silver Tavern, Burden Road, E. The facts were not disputed. On the occasion of an aeroplane raid the applicant was on a ladder outside the house, cleaning a plate, when a bomb fell opposite, and he was blown to the ground, sustaining injuries to the ankle.

It was agreed that if he was entitled to recover, £8 5s. was due, but the defence was that it did not come within the scope of the Workmen's Compensation Act.

Counsel said that a man painting a ship's side who contracted sunstroke could get compensation. The whole principle underlying the working of the Act was that if a man was put into a position where there was a peculiarly special risk—say, in the danger zone—then he was entitled to recover.

Counsel for the defence argued that the risk run had to be near enough to the employment before it came within the Act. If it was a risk general to the neighbourhood, like German bombs, lightning, and so on, then an accident did not arise out of the employment, unless he could directly establish the connection with his work. In this case the man clearly could not connect it.

Judge Graham, K.C., said the case was so important that he should consider his decision.

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Aeronautical Patents Published.

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